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The AMERICAN RIFLEMAN

Vol. LXXI, No. 1 WASHINGTON, D. C., JUNE 1, 1923 $3.00 a Year. 20 Cents a Copy

A PALMA MATCH *for* 1923?

By Capt. EDWARD C. CROSSMAN

I QUOTE herewith an extract from a Canadian rifleman which once more brings up the matter of the revival of the great historic match for the long-range championship of the military riflemen of the Anglo-Saxon countries. This gentleman writes:

"I have recently been elected to the Council and am also a member of the Executive Committee of the Dominion of Canada Rifle Association and it is my intention to recommend to the Council that the Canadians be allowed to compete with the United States for the Palma Trophy, which is emblematic of the long-range rifle championship of the world. However, before competing against your marksmen it will be necessary for us to procure a proper rifle and ammunition. It is possible that the United States authorities permit us to use Springfield rifles and ammunition. Would it be possible for you to suggest a match with the Canadians on the above basis, as at the present time the rifle which we have is not suitable for high-grade marksmanship, although it is an excellent service rifle."

The last Palma match was fired just ten years ago, in 1913, likewise the last year in which we had the pleasure of entertaining the foreign teams in the Pan American and International Matches. Now that ten years have rolled by. and the Great War has gone thundering down the halls of time, we are again to be the hosts of the invading riflemen from Europe and possibly South America, and the time is meet for a revival of the great Palma.

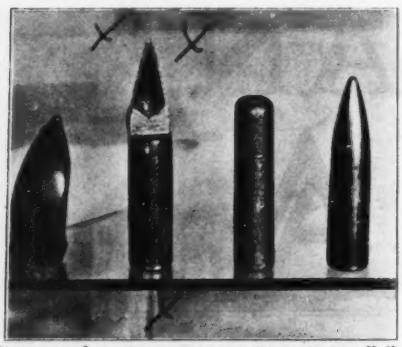
It is not a question of the chances of Canada and England for winning, their mere entry of teams would be proof sufficient of the sportsmanship which has characterized that great match. A roll-call of the Canadian and British riflemen would show only too many gaps in the ranks of the straight pointing gentlemen from whom the teams used to be chosen. The greatest figures in their rifle shooting world are gone, most of them by the route of the German bullet and shell.

The matter of rifles might well be settled by their using the American rifle and ammunition, and letting the match resolve itself into one merely of marksmanship, instead of a contest of rifle, ammunition and man. The rifle of the British and Canadian is strictly a service arm, a very speedy, light, fast handling arm which gave fine results in the trenches, but not at all adapted to the game of putting ten shots into a saucer at 1,000 yards.

As some German military critic put the matter, the British rifle is a sporting rifle, the American a target rifle, the German a military rifle, which comes pretty close to stating the facts. No hand-operated rifle in the hands of troops is in the class of the British for throwing a stream of bullets through the air for short-range work. Were the American rifle entered against the British in a match to see how many shots could be placed in a figure in a given time, it would lose out every time if the range were 200 yards or under. But it has no chance against our arm in a long-range match. It is interesting to look back at the Palma match last fired, in 1913.

HARPER'S WEEKLY
JOURNAL OF CIVILIZATION
NEW YORK, SATURDAY, OCTOBER 6, 1877.

Time was when rifle shooting was recognized as a National sport



Bullet marked "A" shows a section view of the Ross Hollow Point Match Bullet used by Canadians in 1913. This is not the exaggerated version used in the team match.

The Canadians, who had been trimmed by the British teams at Bisley year after year with their long-barreled Ross rifles and peep sights, came down to Camp Perry thirsting for revenge for the defeat of the year before. Without doubt they had a truly formidable team of riflemen, among them Hart McHarg, team coach, George Mortimer, and other such sharks who had defeated the best of the British and Colonial shots at Bisley.

For a rifle they brought the Ross with a peep sight set so far to the rear that the recoil slightly tapped the shooter on the forehead as the sight swung slightly on its pivot, and some of the shooters wore pieces of cardboard under the band of the military cap, worn wrong end to. I fired several strings with the rifle and found it very likely to produce a flinch, although the contact was merely a slight touch. The barrel was 30 inches long as I remember it, the front sight very wide. They had to adhere to the British service case, about like our own 30-40, but the strong mechanism of the rifle permitted much higher pressure than the Lee, and they had made use of the fact.

They had two sorts of bullet, both steel jacket, front closed in a needle-making machine adaptation, with hollow point under the closed packet, much like the bullets which had been winning the great long-range matches at Bisley in Ross match rifles.

Both bullets weighed, as I remember it, 200 grains, both were unusually long, but the one used in the team match itself was the strangest looking bullet modern ammunition development has ever seen.

The point alone was longer than our service bullet, and—going now by memory, because my recollection is not up here in the woods with me—the bullet was twice as long over all as our own bullet, the point being practically a shell—ordinary Canadian air, wrapped with a steel jacket. The front closure of the bullet prevented the pressure of the gas against the base from forcing the leaden core up into the point, because naturally no core was exposed at the rear.

The point was as long and slender as the point of a huge needle, and the cartridge was of course far too long to load through the magazine. The powder was made by Du Pont, the case, I think, also by some American company. The velocity was about 2,300 feet.

The Individual—Palma, fired before the Palma Team Match, saw the small handful of Canadians taking the first three places away from the thousand American riflemen on hand at Camp Perry. All three Canadians who won, showed or placed—Mortimer, McHarg and one other whom I forget—used the shorter bullet of the two strange missiles. The result put something of a chill into the breasts of the American shooters to whom naturally occurred the thought that if about twenty Canadians could take the first three places in a match duplicating the Palma conditions, what would the team do?

So came the day of the team match, a cold, grey, blustery day, with a chill and evil wind hustling over the butts from eleven to one o'clock, and measuring around twenty miles in the heavy puffs. Note that it was a headwind, because on it hinges some queer ballistic theories.

The team included the U. S., Canada, Argentina, Sweden, and, I think, Peru, but as to this again I depend on memory over the ten years since I saw the match.

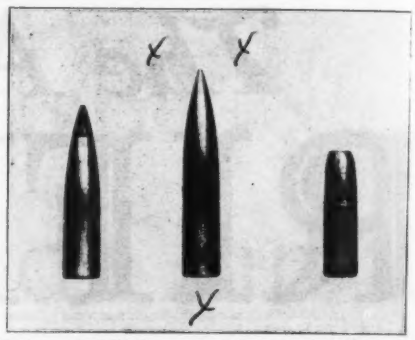
Canada entered their stiletto bullet, a bullet you will remember consisting roughly of about half lead and half air, so far as length was concerned. Argentina used the German 7.65 millimeter Mauser with U. S. C. Co. ammunition and B. S. A. vernier receiver sights. Sweden shot the crudely-sighted Swedish Mauser. Our own ammunition was 180-grain U. S. match nitroglycerine powder of the HiVel or Du Pont 19 type.

That old war horse, Ralph Alderman, of the District of Columbia, consented to coach the Argentinos—and after watching the results of his work at the 800-yard stage, a movement was favorably considered for organizing a lynching bee because it looked very much as if the Argentine rifleman, the German rifle, the British sight, the American cartridge, and the District of Columbia coach were going to do things to the American team. It was pointed out that the receiver sights of the South Americans and the long barrels would give better definition as the range grew longer on that overcast, grey day.

Anyhow, the teams spread themselves along the beautifully trimmed lawns which you will remember are invariably found for firing points at Camp Perry, and presently commenced to push bullets into the teeth of that chill zephyr which had specially waited to come down from Canada across the lake until it thought its riflemen needed it.

A handsome young officer by the name of Captain Mumma sat behind the American team, likewise a bronze-faced chap with a kindly and quizzical Rooseveltian smile who had no more idea of going to the United States Senate from Iowa than he had that the Canadians close by would, in another year, be halting the German rush across the mud of Flanders.

The end of the 800-yard stage found Canada, United States and Argentina horse-and-horse, and so few fours on the papers



Bullet marked "X," the type of front-closed hollow-point bullet with which the Canadians won the first three places in the Individual Palma. An exaggerated version of this bullet lost them the team match.

that a young marker wondered why they put all those rings outside of the bull's-eye.

At the end of 900 the good old steady American team-coaching system, and the good old-reliable Yankee riflemen, listening to the low voice of the coach, had pushed enough bullets upwind into the mean breeze at just the right allowance to make more bulls than either of the other teams. The Argentinos were still hanging on, but something was going wrong with Canada.

The thousand-yard stage found one of the strangest exhibitions ever seen by a great rifle team, and to this day no man knows what the trouble was. While the American team continued on the even tenor of its way, still throwing the hissing 180-grain spitzers into the far-off and indistinct bull, with a few, but very few more shots out in the white, and while Argentina was dropping behind, but not badly behind, Canada had practically been *spurlos versenkt*. She was getting not only plenty of bullets into the white, but some clean misses.

The team was under the capable hands of the great McHarg; it consisted of cool and experienced riflemen, but it was shooting all over the targets.

Old timers still theorize about the cause. Unkind critics charge it to a "blow-up" on the part of some of the men, which I do not believe. Others advance the queer ballistic reason that the head wind actually deflected the long, light, lever-like point of that queer bullet.

The end of the match found United States winning, Argentina second, and the Canadians a bad third. If another and still longer stage had been added, even Sweden might have caught up with her.

It is my own opinion that the trouble lay in the bullet, a comparatively untried form of the proved hollow-point idea, and an exaggerated form, besides.

Either it was inherently unsteady at the long range where its spin had fallen considerably, or else the heavy quartering wind at the lessened velocity had actually deflected that long, hollow, light point, beautifully adapted as a lever against the mass of the bullet well aft.

We know little about the performance of such an exaggerated form of missile, even

(Concluded on page 22)

A Law for the Outlaw

By Allyn H. Tedmon

Time: 1925. Place: A Sporting Goods Store.

THE customer, a young man about to take up pistol shooting, is examining a popular medium-priced hand-gun of .22 caliber.

Customer—"Well, I believe this pistol will be just what I want. It is low in price and shoots cheap ammunition. Same, in fact, as I have been buying from you for 35 cents per box."

Dealer—"Yes, I am quite sure you will be pleased with that little gun. Yes, it takes the same cartridge as your Winchester .52."

Customer—"Well, let's get to business; what now is the price of the handy little thing; eight dollars was it, you said?"

Dealer—"No; I said it *was* eight dollars, but it is *now* worth $108, and the cartridges for it will cost you $50.35 per box."

Customer, staggering back at the unexpected answer—"Why, what's the big idea? No fooling now. At eight dollars and the regular price for the cartridges, 35 cents per box, I will take the gun and ten boxes of cartridges."

Dealer—"I am not fooling, really; that is the price of the gun and the cartridges. Gun $108, and cartridges $50.35 per box. It is controlled by law, you know. The anti-pistol law recently passed through Congress, which imposes a tax of $100 on each revolver or pistol and $1 for each cartridge to be used in such arms. It is rather high I'll admit, but it can't be helped now."

Customer, still dazed and scratching his head—"But, I don't understand; it is outrageous to ask me $108 for this gun and here I just yesterday bought 500 of these same cartridges from you at 35 cents per box. You now ask me $50.35 per box simply because I have intimated that they will be used in this pistol. Say, who in hell was the boob that ever thought up such a law as that, anyway? Some damned reformer, I'll bet, or some other anti-everything."

Dealer—"Well, it is the law just the same, my boy, and we are now in for it, and if you think it is hard on you, just cast an eye over here and see the stock of Colts and Smith and Wesson guns I have on hand and which I am absolutely unable to sell because of this law. Unless some way shows itself this outlay is very liable to put me out of business. No, the law was not written nor started by any boob reformer nor anti-vivisectionist; however, on the other hand it was written and first offered by Chief Magistrate McAdoo, of New York City. The place you may recall where the Sullivan law has been in force so long and where it has stood out as a glaring failure from the first."

Customer—"What! you don't mean to tell me that a man in his position offered such a Bolshevik law as this do you? Why, man alive, laws like that Sullivan law and this one, which is new to me, are nothing else than Laws for the Outlaws. You are sure that a Chief Magistrate of the World's greatest city wrote and promoted it?"

Dealer—"Yes; and what's more it was unanimously endorsed at the meeting of the Third International Police Conference held at that time. The Chiefs of Police from all the larger cities were there and they, along with others of the same mind, forced the bill through, and it has become a law. As you have so truly said, a Law for the Outlaw."

Customer—"But, for heaven's sake, why didn't somebody do something and keep the damnable thing off the statute books. Why, who is there in Congress who is fool enough to pass such a law. Why, I am surprised that something wasn't done to stop it. Why, it makes me sore to think of it. I'd like to get hold of the mut who voted for it. My gosh! who ever heard of such a thing; you would think this was Russia the way things go, wouldn't you?"

Dealer—" Young man, the reason why this bill became a law was because the anti-pistol people were organized and the citizens were not. When it came to a showdown on the floors of Congress, the anti-pistol people had the lobby filled with men and women demanding that this bill become a law. The opposition was represented by two or three manufacturers who made revolvers and pistols, and a few other men who had seen the danger and who had yelled themselves hoarse and written themselves out trying to wake the shooters up. But when the show-down came they were alone, and the anti-pistol radicals were there in droves, and today we are in our first steps to complete disarmament. You may hold your head up today and snort around, too late to be sure, but unless you and all others like you wake up, you will be going around with lash marks across your back and with the awl marks of a slave in your ears. The people will be without arms, you will be one of them, and an unarmed people are a conquered people."

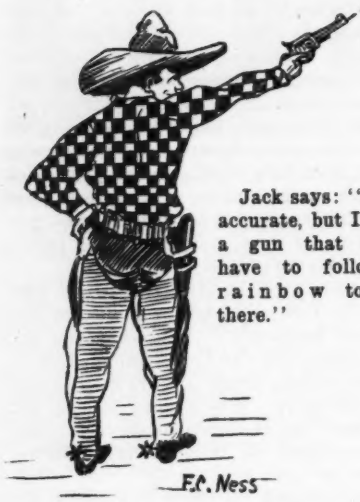
Customer, showing much spirit and very red in the face as he begins to realize just what has happened—"Yes, what you say may be true, but the Constitution gives us the right to bear arms. It says we may and we always have. Who's going to stop us? Why don't the Government do something. Now you speak of these things I do remember of reading some articles sometime ago in the *Outdoor Magazine* about some sort of a proposed law or something, but I didn't pay much attention to it. In fact, didn't read much of it. I didn't suppose any one living in this country would seriously think of such a thing. I thought it was a joke."

(Cont'd on p. 22)

"I said it was $8.00; but now it is $108"

WHICH? A VITAL QUESTION

By F. C. NESS



Jack says: "She's accurate, but I want a gun that don't have to follow a rainbow to get there."

AFTER the pistol shooter has become proficient and able to score 80x100 right along on the Standard American Target, to land more than half his bullets upon the stern end of a sugar-corn can at fifty yards, or upon a sparrow at twenty yards, he comes to a period of temporary despondency. The weak popping and the steady string of pin pricks made by his .22 become monotonous. He longs for variety, more decisive results, louder report, bigger hole in the target, or greater smashing power to his bullet. Though history has shown—and history has a way of repeating itself—that eventually he will realize his mistake in making the change, when the increased cost of his ammunition has cut down alarmingly the number of shots per week he can now afford to use. So, no matter how many of the big-calibered hand-guns he owns now, he must needs have a .22 in his outfit. However, there is no stopping the crank from trying the bigger calibers when the mood compels him. He will never be satisfied until he has learned through his own efforts.

The wise thing is to choose a caliber that enjoys the same high standard of accuracy that he has become accustomed to in his .22, and one that has the same freedom from disturbance, due to light recoil. This means a hand-gun bored and chambered for either the .38 S. & W. Special, or the .32-20 cartridge.

But, when this victim of his own temperament is a reader of history, has an imagination, and is readily moved by sentiment, he is liable to take a radical departure from the old order of things, and change directly to one of the most powerful hand-guns, disregarding absolutely the fact that they are not only inherently less accurate than the weapon with which he has become familiar through long association, but on top of this are also infinitely more difficult to control, due to mechanical disturbance, and recoil. I plead guilty.

Years back, when the .38-40 and .44-40 rifles were popularly used, Samuel Colt got out his Frontier model, around 1870, so that users of the old Model 1873 Winchester could employ the same cartridge in both revolver and rifle, and making it unnecessary to lug more than one kind. These single-action six shooters were shot with more or less effect up to one hundred yards. About eight years later a true revolver cartridge was developed for the utmost power and knock-down force at real revolver ranges—twenty-five yards or under—being loaded with from 38 to 40 grains of black powder and a lead bullet .454 inch in diameter, weighing from 260 to 265 grains. This single-action, .45 Colt six-shooter, capable of shooting through 8x8 pine timbers, was dubbed the Peacemaker because nothing could stand up against it at typical revolver ranges. Remarkable shooting was done by *some* of the rugged old-timers with these powerful hand-gun calibers.

In the mountains, and broken or timbered country, the .44-40 found much favor. But due to a slight difference in speed and trajectory the .38-40 was the favorite among the plainsmen who shot over wide open stretches, while the .45 reigned supreme for short range, self defense, gun fighting, and so on. Now, the Winchester calibers are obtainable loaded with smokeless powder and metal-cased, soft-nosed, or hollow-point bullets, and since border demands have vanished, the requirements of civilization have brought about the under loading of the .45 Colt, the factory smokeless cartridge now sold being much pleasanter to shoot, and weaker. The only way in which the old-time results can be gotten is through hand-loading by a man who *understands thoroughly* his business.

Of the three, the .45 Colt is the most accurate. And the .44 Special is more so; in fact, the latter is second only to the .38 Special. But "accuracy" is an elastic term, absolute, relative, or indirectly meaning the shooter's ability with that particular gun. Thus, if we mean the barrel's capacity for placing each shot close to those preceding with the same aim, the above comparison is true. But, if by "accuracy" we mean the cartridge's ballistical capacity for keeping the bullet close to the line of aim at all ranges, the above comparison becomes false, because the .38-40 and .44-40 have a much flatter trajectory than the sluggish .45 Colt or .44 Special, and by this definition they are more accurate than even the .44 Special when shooting over unknown ranges. Again, when accuracy is defined from the standpoint of the shooter's ability to make connections, one quality might tend to counteract and neutralize the effect resulting from the lack of another, equally essential quality, much depending upon each shooter's own peculiarities.

For illustration, George is an excellent shot with his .38 Special on the target, where the range is constant and his sights are set for it. But in game shooting beyond fifty yards, he is a poor judge of distances, consequently shooting over or under his mark and only making two hits out of five, and with his .38-40, which makes a group on the fifty-yard target fully twice as large as his Special; even when held perfect, he can make only mediocre scores, because the speedier charge makes the gun harder to control, also. But the flatter trajectory of the .38-40 enables him to get his elevation perfect at unknown ranges, so in spite of its bigger groups and its greater difficulty of being controlled, or properly held by him, he gets two hits out of five on game over unknown distances. Thus, for game shooting he is thoroughly justified in claiming the .38-40 is fully as accurate as the .38 Special. But let us see what Jack thinks.

Jack is a Western rancher. He always keeps his six-shooter handy; indulges in daily practice. Paper targets, "one-inch," "two-inch," or "eight-inch bull's-eyes," "twenty yards" or "fifty yards" mean nothing to him. What he calls target practice is to slam the head off a rattler at six feet and then comb the hair of a coyote at one hundred yards with the next shot. His cousin back East had sent him a gun for a Christmas present.

His cousin was a member of a revolver club and used a Colt Army Special .38, but he knew Jack would consider nothing smaller than a .44 fit for a man's use. He had seen T. K. Lee shoot out fifteen "possibles" hand-running with his .44 Special, Smith & Wesson Military Model, so he decided that would be the kind of a gun for Jack.

It certainly was a fine gun, none better made. Jack liked it. One day he stopped to eat his lunch at a little spring between two low hills. He had taken the "present" along to try it out. He picked out a white stone on the opposite hillside, about forty yards from him. He fired a lot of ammunition at small targets on that hillside. By George! She sure did shoot fine. But he thought that "saw-handle" hurt his hand more than the big handle of his .44-40 Single-action Colt. Then, out on the plain beyond the mouth of the gulley, he espied a "buffalo chip." Some unknown force, an

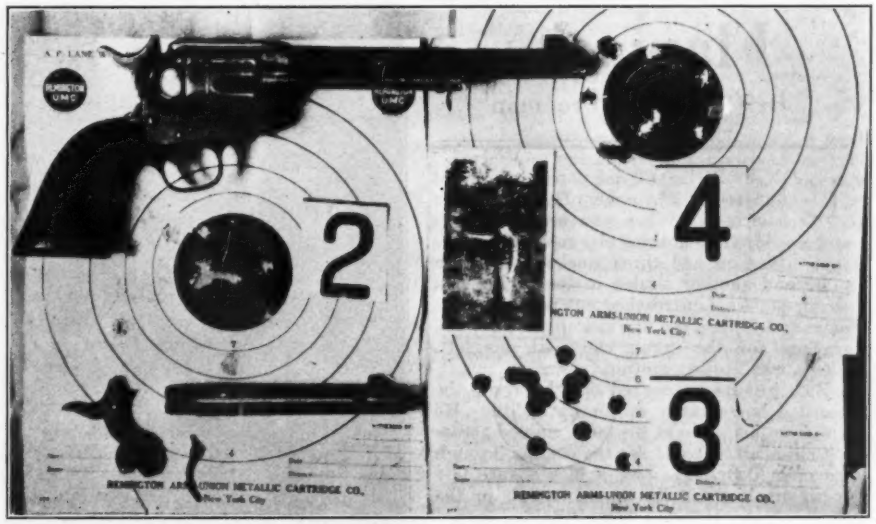
excavating gopher or a cattle-hoof, perhaps, had up-ended it, and there it was with its twelve-inch broadside facing him. "Must be somewhere's between a hundred and a hundred and fifty yards, hard to tell very accurately on account of the difference in light." In the hollow, where he was, it was gloomy, but out there it was dazzling under the direct rays of the sun. The first bullet fell rods short of the mark. Jack swore, in his surprise. With coarser aim the next, still, fell twenty yards low. Jack looked at the .44 Special in disgust. Aiming so high he thought the bullet would surely carry to the next ranch, Jack fired again. A small twig with a couple of leaves attached spun down from a middle branch of the cotton-wood standing at the mouth of the gulley, but the "chip" fell flat, minus an upper section. That settled it for Jack.

"She's accurate all right," he said, "but so is a bow and arrow. I want a gun that don't have to follow a rainbow to get there."

Jack was no ordinary gun wielder to be satisfied with just good results. The perfect shooting he got out of his .44-40 S. A. Colt made him demand more than that. He had done a lot of experimenting to get the right diameter and weight of bullet to suit his own individual barrel, and just the proper temper and mixture to concur with the idiosyncracies of that particular tube. Then had followed the trying of different brands of powder until Jack got the most perfect charge possible for his own peculiar gun and bullet. This load he stuck to, loading his shells two hundred at a time with bench tools and weighing his powder frequently on a delicate scale to see it kept uniform. Thus he had gotten almost the accuracy of the .44 Special, and still kept the ballistics of the speedier and more powerful .44-40 intact. Because the .44 Special couldn't meet all these requirements, Jack insists that the .44-40 is the most accurate.

But a stranger finally came to occupy the neighboring ranch and Jack soon learned that he had a peculiar shooting outfit. He had a .44 Single-action Colt like his own, but he shot both the .44 Special and the .44-40 through the same gun by merely changing cylinders. But he had gone Jack one better, in that he had loaded the .44 Special up to the speed of his own gun. He said the .44 Special was a shorter shell, made a better-balanced revolver load possible, and proved his own hand-load was a shade more accurate than Jack's pet load, when they tried it on paper from a rest. But it was certain when each used his own gun no difference in ability of either gun or of either man was manifest. So it is with hand-loads, as it was with factory ammunition—it depends a great deal upon the shooter himself.

Then there was this police inspector of the C. R. M. P. who shot out nineteen consecutive "tens" on a standard target, in an official competition a year ago, with his .45 Colt New Service, 5½-inch barrel, and regulation heavy pull. But then, we are not all Sandys-Wunches, nor is the .45 Colt ideal for long-range shooting. Someone is sure to say, "Why not compromise upon the .32-20? Here is an accurate and speedy load with a flat trajectory." True, but the little 115-grain pellet is not the best killer upon big game. With less intrinsic accuracy the .38-40, .44-40, and .45 automatic are all superior killers, and have enough field accuracy. In such game shooting, where only solid blows count, it is useless to miss with a flat-flying load that is too powerful for the shooter to control, and it is as useless to miss with an accurate load that has too high a trajectory to make connections at long, unknown ranges. Perhaps it is worse than useless to hit with a load that is amply swift and straight and easy to control, but inflicts only a superficial wound when it does land.



A DUAL-PURPOSE PEACEMAKER

Above: With 7½-inch barrel and 2½-pound trigger pull, it makes a splendid plaything
Below: With 5½-inch barrel and a 5-pound pull, it becomes a He-Gun
No. 2. 10-shot group, the average result with the Peacemaker and factory ammunition
No. 3. 15 shots with bond wad cutter 454510, 190-grain bullet and 14.1 grains (by weight) of No. 80 powder
Concentric rings indicate the 20-yard black
No. 4. 10 shots with Ideal Ex. 454190 hollow-point 235-grain bullet, and 11.75 grains (by weight) of No. 80 powder

"Gosh! but it's confusing," you say. But the problem of selecting the ideal handgun is nothing if not confusing. There hain't none? Lots of them, if we would stick to true revolver ranges and not pick on big game until they come into our front yards.

Four Foreign Bargains

By J. R. Mattern

THE most hardened of shooters may be excused for "falling for" some of the German-made firearms advertised at astonishingly low prices during recent months. Hope will not down that after all these products of formerly reputable makers may be up to standard in essential details, if not in mere finish or other nonessentials. Here is evidence to show that some recent purchasers were disappointed in getting even the basic features of standard quality.

I was attracted by the offer of a railroad man to trade me his *8-millimeter Mauser with telescope* for an old Krag carbine with military sight—for a six dollar value, we may say. We retired to the inevitable impromptu testing ground, the old quarry at the edge of town, and proceeded to demonstrate, as I objected to swapping "sight-unseen."

That foreign gaspipe wouldn't shoot. That was all the conclusion we could reach. Whether the bore was oversize or full of enlarged pockets or actually crooked we didn't take time to investigate. The six dollar Krag was the more useful piece of ordnance. It would shoot and it would shoot fairly well, and its ammunition, in addition to being available at ten cents a shot, could be had cheaply from the Government, or could be reloaded with good and easily obtained components.

Another Mauser bought by a hunter who imagined he was getting a $75 gun, had a firing pin too short. It would fire about every third cartridge. He attempted to heat and draw out the point, but broke it off. It seemed to be of inferior steel. Finally, he made a new firing pin or striker at a local machine shop, spending, perhaps, $15 on the thing by the time all items were totaled.

The telescope rifles attracted two other of our old timers. Billy P, sold his Model 95, 40-72, and bought him a Hun 8-millimeter with 'scope. He has done so little actual firing with it down to date that he can not

(Concluded on page 22)

Flapjacks

By Carl Elmo Freeman

LON FERGUSON did not as a rule eat flapjacks for dinner. But you know how it is. When you want flapjacks and maple syrup nothing else seems to hit the spot. So Lon had three stacked in his tin plate and another sizzled in the frying pan on the stove. Lon reached out with his right hand and flipped the flapjack in the pan, and reached for the syrup can with his left. There was no lost motion.

But, just as he poured out the syrup, he heard a horse rattle an empty saddle. He slid from his place at the table, angled across the room till he could see the corrals through the open door. He saw a blazed face bay horse drinking at the water trough in the open corral. His own horse "Baldy," gazed inquiringly through the pickets of the round roping corral at the stranger. Lon recognized the horse as belonging to Al Peters with whom he had disagreed that morning over the location of a division drift fence on the Forest. Then, he noted a glistening dark blotch on the cantle of the saddle, another streak on the sweat fender.

Quickly Lon stepped to the corrals, saw the dark blotch was blood, bloody finger prints on the nickled saddle horn, the splotch on the cantle was smeared to the left. A clot appeared to be stuck on the slick leather. Lon touched it with his finger and found it was plugging a bullet hole. Lon dug out the bullet which had lodged against the metal plate under the flint-hide covering.

"Huh!" he grunted. "A forty-five—metal jacket. Probably hit the hip bone. Peters hung on quite a spell though, to bleed that much. . . . May not be dead yet—I'd better step on the wind!''

Lon went into the roping corral, saddled Baldy and started to back-trail the horse. Out a hundred yards, he turned back to his cabin. There, in smoke-filled room, he threw out the burning flapjack, took a double-barrel derringer 41 from a shelf, and inspected the two rim-fire shells in the stubby barrels.

"Can't shoot the thing any more accurate than I can throw a wet cob—but it's good in a rumpus," he remarked, dropping the gun in his left shirt pocket.

The trail came down from the foothills out of the National Forest in which Ferguson and Peters had grazing permits. He and Peters had asked for permission to build a drift fence between their two grazing districts, but when Bob Thomas, the Forest Ranger, had come over to survey out the fence line that morning, Peters and Ferguson had disagreed on the exact location and a few hot words had passed. Thomas, the Ranger, had left without blazing the fence line saying he would do that when the two men had agreed upon a range division.

Lon followed back on the trail and passed the west ridge of the little saucer-shaped valley that he and Peters had both wanted on their side of the fence. Just as he came down through a grove of scattering pinons, he found Peters. Lon dropped off his horse and turned the man over on his back.

Flapjacks, Copyrighted 1923, by Carl Elmo Freeman.

Lon held his hat with a stick in his right hand and took his six-shooter in his left

"Dead," said Lon. "Shot through the middle—and from in front. . . . Tried to stop the blood with his left hand and make it to my place, cause it was closer. . . . That helps a lot, Al, even if we did get peeved on the fence deal—you was comin' to me for help!"

Lon picked up the fallen hat, placed it over Al's face and was untying his slicker on the back of his saddle to spread over the dead man when Bob Thomas, the Ranger, rode into the open.

"Stick 'em up!" snapped Thomas.

Lon saw he was covered and raised his hands. He noticed Thomas' gun was a 38 officer's model. Thomas dropped to the ground. As he did so, Lon recognized a beautiful opportunity for a snap shot from the hip, but let it pass.

"What's on your mind?" he asked.

"Turn round," demanded Thomas. And, as Lon turned, Thomas lifted the triggerless sixshooter from the worn scabbard at Lon's hip.

"I thought you two would get to shooting, so I came back," said Thomas, "and I wasn't wrong!"

"Do you think I killed Al?" drawled Lon.

"Why no, he died of snake bite," Thomas stooped to sarcasm. "Get on your horse—I'm taking you to Twin Oaks."

"Let me spread my slicker over him 'fore we go," said Lon, turning back to his saddle.

"It won't do much good—but go ahead if you want to," and Thomas swung back on his horse.

As Lon loosened the whang saddle string about his slicker he felt the weight of the derringer in his shirt pocket against the muscles of his left arm. He turned with the slicker in his hands, stepped to the dead man and spread it over him. The skirt of the slicker flopped back in the light wind and Lon straightened it.

"Come on, don't take all day!" snapped Thomas, replacing his gun in its flap holster. "I'll send some one out to look after him——"

"Do," said Lon, and Thomas found himself looking into the barrel of the derringer. "Don't linger—just step on the wind."

Thomas stepped. As Lon saw him fog into the timber toward Twin Oaks, "There goes my grazing permit on this Forest," he drawled. Then, "Hell! He's got my gun! . . . Hay, Thomas!" he called, but Thomas did not turn.

Thomas was a good Forest Ranger. A graduate of a school of forestry, he knew trees but he did not know men. So he rushed into Twin Oaks and told Stone Davis, the Sheriff, that Lon Furguson had just killed Al Peters over on Badger Flat and would have killed him too, but he had stood Furguson off.

Stone had just received a delayed telegram stating that a desperate prisoner had broken out of the Zero jail, killed the jailor and escaped in a black runabout. Stone remembered seeing such a car go through about 11.30 and here it was after 1—an hour and a half's start! And now on top of that here was Thomas announcing a murder.

When Lon saw Thomas was going to reach Twin Oaks as quickly as his horse could take him, he turned back to Peters. His mind again swung to the pleasant thought of Al trying to get to him for help. His eyes took in the tracks of Al's horse where it swerved under the rider, trying to balance the sagging weight in the saddle. The tracks showed the horse had stopped where Peters fell, then continued on toward Furguson's.

Lon took a notebook from his pocket, scribbled a few words, tore out the leaf and stuck it in the hatband over the dead man's face. He then mounted his horse and followed the horse-tracks back. In a few minutes he found a Bisley, model 44. sixshooter.

"Three empty chambers," mumbled Lon, as he examined it. "Two fired—guess he carried the hammer down on an empty." A little farther on he saw something glimmer in the grass. He got down and picked up two empty 44 shells. "Ye-ah, he had the habit of replacing empty shells with live ones at the first chance—I'll bet someone is packin' some lead!"

Where the horse tracks crossed the old wood road leading to Twin Oaks, Lon knew he had arrived at the scene of the fight. There were jumbled horse tracks and the fresh imprint of automobile tires in the dust of the road.

"There's where he trotted down to the road, stopped, stood a minute, then there's where his horse jumped out of the road and the car passed—huh!" Lon gazed at a damp streak suddenly beginning between the tracks. "Al punctured their gas tank—why didn't he puncture the driver?"

Lon looked all about for empty pistol shells. He again examined the battered steel jacketed bullet he had picked from the saddle. He knew the bullet was from one of those rimless 45 shells used in automatics. He figured the ejected shell would be to the right of the car if the shooter fired at Al on his horse in front. But he could not find a shell. He found a trench cut between the car tracks near the left track in the road where a bullet had plowed. This he took to be Al's. As the still damp streak began just beyond this, he felt sure it was the bullet that had punctured the gas tank. In that case the hole in the tank must be in, or very near, the bottom. He felt certain he would find the car close by, and loped down the road.

In just a little over a mile he found the car, a big six-cylinder roadster. A broken windshield and a perforated gas tank told Lon the story.

"Only one bird in the car, an' he shot first. Al didn't shoot till the car had passed him, here's the hole in the back of the top where the bullet that broke the windshield went through," Lon figured the angle. "Yep, that was Al's first shot. Then, as he could not see the driver he shot at the tank."

Beside the car on the ground were three empty rimless 45 pistol shells. On the floor of the car was a live shell, metal jacket, and an empty cartridge box.

"Wonder what he shot at here?" Lon grumbled, then noticed scratches on each of the empty shells. They were two in the groove on opposite sides of the shell.

"He didn't shoot here—he reloaded. Them is clip marks. He's luggin' one of them Army revolvers, model '17, that load with them fool clips carryin' three shells each."

Lon saw the footprints of the man leading off toward the low hills to the north. He kept Baldy on the trail in a slow trot. Occasionally he would lose the trail on a rock outcropping but usually by watching ahead and taking the course most likely selected by a walking man, he readily picked it up again. About 3 o'clock the trail went up the floor of a canyon and Lon began to go carefully. He knew the man must be a stranger in the country or he would have known this canyon was a cul de sac with steep precipitous walls, only scalable in two or three places and those were dangerous.

Baldy was picking his way over the boulders where the walls came close together, when a bullet smacked on the granite and the report reverberated down the canyon. Lon dropped out of the saddle, slapped Baldy with his hat and ducked behind a big rock. Baldy, instead of whirling back down the canyon, dashed up a few feet, then stood looking back where Lon had been, in a surprised, hurt manner. Then, apparently recalling that Lon never did anything without some good reason, he held his head to one side so he would not step on the dragging bridle reins and walked up farther. Suddenly he lunged back as he caught sight of a crouching man behind a boulder.

This action gave Lon almost the exact location of the shooter. Otherwise he would have been unable to locate him without drawing another shot. Even then, the reverberations and the smokeless powder would have made it difficult to accurately locate his position.

Lon took off his hat, put it on the end of a stick left there by the winter freshets and held it up over the edge of the rock. He was careful that the hat tilted back as it would appear on a man's head, and not level. He peeped around the lower edge of the rock and saw the round muzzle of a sixshooter held against the side of a boulder about forty yards up the canyon, saw it bounce as a bullet careened off the rock beside the hat. Baldy snorted and moved up around a bend in the canyon.

"He don't savvy shootin' a sixgun," grinned Lon, "or he wouldn't rest the barrel against anything when aiming. Then Lon realized that he didn't have his own gun, but the 44 Bisley dropped by Al Peters. His belt was full of 45 shells and there were only three 44's left in the cylinder of Al's gun. Lon cursed Thomas under his breath. Then he remembered he could not shoot his own triggerless six-gun with accuracy at that distance. He was only "deadly" with it at short range when he snapped, or fanned the hammer. Possibly he could make the three 44's count more when carefully aimed than his whole belt full of 45's would have scored if "snapped" at that range.

Lon reached back, took a flat rock and tilted it against the right side of the big boulder, then placed another on the left side. He knew he would naturally be expected to shoot from the right side so he held his hat between two sticks in his right hand and took the sixshooter in his left. Then he lay down on his side, rested his left wrist against the boulder under the leaning rock and stuck his hat in front of the opening under the leaning rock on the right side. As he expected the man fell for it. The blued barrel again appeared and rested against the side of the boulder. Lon aimed carefully but was too slow, the man fired and the gun disappeared before Lon could get a bead. His hat had a ragged hole in it. Lon then saw that the bullet had ricocheted from the slanting surface of the boulder and this gave him an idea.

"Maybe I can make a bank shot too," he growled. "Here goes for the 'leven ball—ought to get him in the legs!"

Lon took careful aim at the slanting side of a boulder just in front and to the right of the one behind which the man lay. A white splotch appeared on the boulder and Lon cursed his lead bullets.

"Lead splatters like mud——" He involuntarily ducked as a bullet sang by his head.

Lon thought a moment, "He's got two more shells in that gun—if he hasn't reloaded. He probably hasn't if he's fiddlin' with them fool clips. . . . If he shoots twice—he hasn't, an' I'll take a chance and rush him. If he shoots once, I'll lay low. . . . Wish I had some of them flapjacks!"

Again Lon carefully aimed at the slanting side of the boulder, crouching, ready to spring out and rush, if the man replied with two shots. Again the splotch appeared, just below the first one.

There was a commotion and the man's head showed on

(Concluded on page 14)

THE BALLISTIC PRIMER

by

J. C. GRAY

PART I—THE BULLET

THE interest with which firearms are regarded by great numbers of men is shown in the question columns of THE AMERICAN RIFLEMAN. Hundreds of queries are answered, of the most widely extended nature. One asks regarding the killing power of certain cartridges, another about accuracy, still another about the path of the bullet, and so on, almost without end.

The affair of the rifle bullet—what it will do, and why—has been the object of study and experiment for at least a century. Not every man who rides this hobby is so fortunate as to have access to the results of all this work, and the urge to write about it after finding out some of the things that have been learned is the excuse for these papers.

You know how it is—just as soon as you get some new bit of information, your first impulse is to find a good listener.

Knowledge of cannon, rifles and all manner of machines operated by gunpowder has greatly increased during the past few years. What we know today concerning the flight of a projectile is far in advance of what was known even five years ago and facts are being learned almost daily. Some of the story is told in what follows, particularly as to small arms and more especially the rifle and the rifle bullet.

The modern rifle is the product of man's search from earliest times for an effective means of killing his enemies and the animals that provide his food and clothing. In it and the cartridge it uses are combined the results of the knowledge of the engineer, the chemist, the metallurgist and, in some manner, nearly every branch of modern science has added its share. There are almost as many variations in the rifle, considered as a machine, as there are kinds of fish in the sea, but they are all alike in one respect, that of using an explosive to propel a bullet through a grooved tube.

The grooved tube is said to have been invented by Augustus Kotter, of Nuremberg, in 1520, but for centuries its use was restricted by reason of the mechanical difficulty of assembling the charge and bullet in the gun, ready for firing.

Many attempts were made to overcome the difficulties of loading a rifled arm, but it was not until a cartridge was devised in which were combined the cap, powder and bullet and which could be readily inserted in the breech of the arm that the rifle began to assume its present form. This development took place about the year 1860.

Rifle cartridges are familiar to everyone, yet how many will recognize that the case, the primer, the powder and the bullet each present a separate problem and that all are dependent upon what is wanted as a result of the combination.

The first thought in considering a new type of rifle and ammunition is "What do we want the bullet to do?" All other considerations hang on the answer to this question. Assume, for example, that it is desired to deliver a blow sufficient to kill at one thousand yards from the gun and we want to deliver a number of blows as nearly as possible at the same spot. Meanwhile, if the range is only eight hundred yards, we want to be able to hit just the same. Thus it may be said our requirement is for the most accurate bullet; having the flattest trajectory, or path; to deliver a blow equal in energy to that of a weight of three hundred pounds falling one foot.

The ability of a bullet to deliver a blow is dependent on its velocity and weight. This ability is called *energy* and is present in the flying bullet by reason that *work* has been done upon it by the expanding powder gases. Energy is usually expressed in foot-pounds, being capacity for work as measured by the work required to raise one pound one foot against the force of gravity. As in other things, there are more ways than one of saying what is meant, and so in this case, energy can be explained in terms of mass and velocity by a formula as follows:

$$E = \frac{mv^2}{2g}$$

In this formula E = Energy in foot pounds

m = Weight of projectile in pounds

g = 32.16 which is the acceleration due to gravity in feet per second for every second of fall

v = Velocity of the projectile in foot seconds.

Now that we have a formula for energy, the problem is on the way to a solution, for we can put the three hundred foot-pounds of energy on one side of this formula thus:

$$300 = \frac{mv^2}{64.32}$$

and proceed to consider some other things, for example, the *weight* of our bullet.

If the bullet is too heavy it means that the powder charge required will be large and that powder pressures will be excessive. On the other hand, if the bullet is too light, the initial velocity required will be so great as to be impracticable. The choice of weight is more or less "cut and try"; so assume a weight of one hundred twelve grains. There are seven thousand grains in a pound and as our formula was in pounds, we shall have to divide this one hundred twelve by seven thousand to get the equivalent weight of the bullet in pounds. Thus

$$112 = \frac{.016}{7000}$$

Going back to the formula for energy, we now have

$$300 = \frac{.016v^2}{64.32} \quad \text{or} \quad v^2 = 1{,}206.00 \quad \text{and}$$

v = 1098 foot-seconds.

Next in line for consideration is the diameter of the projectile. Think of what we are trying to do and it will be seen that the question as to how the bullet is going to get out there at a distance of a thousand yards has an important bearing on the caliber. We know the ability of a bullet to "buck the wind" is expressed by what is called its ballistic coefficient, a number which shows the degree of the quality possessed by the bullet to traverse the atmosphere. This is usually designated as C. This ballistic coefficient may be expressed in terms of sectional density, that is to say area divided by weight. Thus $C = \frac{w}{d^2}$, in which w is the weight and d is the diameter of the bullet. This expression is modified by the form of the bullet, as the form has considerable effect on the bullet's flight. Thus a factor which may be called i = the form factor, is introduced and the formula finally reads $C = \frac{w}{id^2}$. It will be seen that a large C is advantageous. Therefore, the diameter,

which was being considered a moment ago, should be as small as possible, consistent with knowledge of machine design, for the rifle is a machine, limited by convenience of manufacture. Let us fix the caliber at .25 inch.

Getting back to consideration of the grooved tube through which the bullet is to be shot. It may be convenient to bore and finish the hole to just a quarter of an inch, so the grooves will make the effective diameter a little greater. If the grooves are .0035-inch deep, and experience has taught that this will be a proper dimension, then the Effective Diameter of the bullet will be a quarter of an inch plus the depth of one groove and will equal .2535 inch.

Returning to the formula for the ballistic coefficient of the bullet we have

w=.016-pound
d=.2535-inch
i=unknown

But various forms of projectiles have been fired time and time again to actually determine what this form factor may be and it is known from this experience that the form factor of a very good shape may be estimated say at .48. Putting this value in the formula

$$C=\frac{.016}{.48x.2535x.2535}=.5187$$

It is now necessary to use what are known as ballistic tables, such as were prepared by the late Colonel Ingalls, of the United States Army. Ballistic tables contain values in numbers for the factors affecting the flight of the bullet. These factors have been deduced for a standard shape of projectile from experimental firings. With the use of the ballistic tables and the data now available, it is possible to calculate the initial velocity required in order that the bullet may have a remaining velocity of 1,098 feet per second at a range of one thousand yards.

From the ballistic tables the formula for calculating velocity is

$$S(V)=S(u)-\frac{x}{C}$$

in which S(V) and S(u) are space functions corresponding to initial and remaining velocities, respectively, x is the horizontal range in feet and C the ballistic coefficient. The values are as follows:

S(V)=The quantity we desire to find
S(u)=10008.3 (opposite u=1098 in the tables)
x =3000 feet
C =.5187

Putting these values in the formula we find

$$S(V)=10008.3-\frac{3000}{.5187}=4224.6$$

which corresponds to a muzzle velocity of about 2,235 feet per second. This velocity is well within the limits which experience indicates to be practicable and it might be possible to reduce the weight of the bullet still further, assuming the very good form factor, and still have a suitable ballistic coefficient.

Let us repeat the operations with a bullet of 98 grains weight, or, .014 of a pound. This weight will probably not lend itself so well to the very best form so we will assume that i=.52. We shall have

$$C=\frac{.014}{52x.2535x.2535}=.4189$$

$$E=300=\frac{.014^{-2}}{64.32} \text{ and } v=1174$$

which corresponds to a muzzle velocity of 2,867 feet per second. This is a practicable velocity, so it may be said that we require a bullet in weight between 98 and 112 grains, having the best form we know and, as an excess of energy is not detrimental, a high muzzle velocity.

Editor's Note—The Ballistic Primer, the work of a man who is well fitted to discuss his subject, is presented for the purpose of placing before the non-technical rifleman the relation of ammunition components to themselves, to the weapons in which they are used and to the wider problem of accurately and precisely propelling a missile to a distant mark.

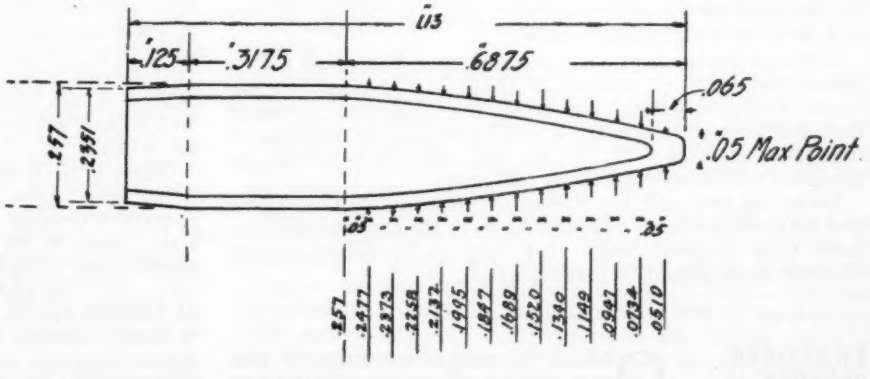
This paper will be followed by others from Mr. Gray until the entire subject has been covered.

It is the belief of the Editors that Mr. Gray's discussion will give to many readers of The American Rifleman a clearer and more comprehensive understanding of the more technical articles which appear in each issue and which presuppose a general knowledge of the basic principles underlying that most interesting of subjects—Ballistics.

Now we are getting to the matter of form of projectile and it will be necessary to draw on experience very largely. Experiment has shown that a long bullet is better than a short one, so we can start off with at least four calibers, or, say about one inch, as the length desired. Further, it has been found—and this is not so very new, having been stated by Sir Joseph Whitworth many years ago—that a taper base helps out. Experiment shows that about one-half caliber in length of taper is enough, so we will make the taper base .125 inch in length with an angle of taper of five degrees. This angle is also chosen as the result of experience. It may be well to take a point of length about two and two-thirds calibers, leaving a caliber or perhaps a little more, for bearing in the barrel. It will be impossible to make the point absolutely sharp, therefore it will be made .05 inch. To make the curve of the point we will pass a circle of radius eighteen calibers from the point to the place where the bearing begins. This form will look something like the drawing (Figure 1). The weight as calculated should be about 110 grains.

The weight and form of bullet having been tentatively determined, in a regular development program the next step would be to make up a number of the bullets and investigate the practicability of manufacture. At the same time some form of cartridge case would be chosen, the necessary modifications made, if any, to the case, and to a rifle to handle it, and some shooting would be done with a view to finding out whether the bullet were accurate, what angle of elevation would be required for various ranges and muzzle velocities and so on.

As this is simply an attempt to outline the procedure required you can see that, for us such an action is unnecessary, and for the moment we can leave the subject of the bullet and go forward to the next step, which involves the method of determination of the powder charge required and the form of cartridge case best adapted to our needs.



The American Rifleman

PUBLISHED SEMI-MONTHLY ON THE FIRST AND FIFTEENTH DAYS

By

THE NATIONAL RIFLE ASSOCIATION OF AMERICA

AT 1108 WOODWARD BUILDING, WASHINGTON, D. C.

A CHANGE OF NAME

WITH the issue of June 1, 1923, ARMS AND THE MAN becomes THE AMERICAN RIFLEMAN.

Through thirty-eight years of uninterrupted existence this publication has served the shooting fraternity and has fostered the art of marksmanship. Starting its career as THE RIFLE under the able direction of the late Arthur C. Gould, its name was changed in 1888 to SHOOTING AND FISHING, under which title it was published until 1906, when under the editorship of General James A. Drain, the magazine became ARMS AND THE MAN.

Each of these changes were apparently dictated by a desire to keep the title closely related to the fields which the publication covered during these different periods. And again the time has come, in the belief of the present management, to give the magazine a name which will bear a more pertinent relationship and carry a deeper significance to the shooting fraternity. Hence THE AMERICAN RIFLEMAN is presented to the shooters of the country.

The new name was chosen not only because it is representative of all for which the magazine stands—the shooter and his sport, whether on the range or afield, but also because it links the publication in the minds of the rifle clan with its very honorable ancestor, THE RIFLE.

More and more during the two years past, the editors have been striving to emphasize in current numbers those features which established THE RIFLE as an authority in the field of firearms and the sport of marksmanship, which may briefly be epitomized as authoritative contributions by qualified writers. That in some measure success has attended these efforts is evidenced by the great increase in the magazine's circulation, and the fact that added pages have been justified even in the face of a much greater financial outlay.

With the change in name, THE AMERICAN RIFLEMAN will be placed on the news stands. Friends of the magazine can render a very important service in this connection by seeing that local news dealers carry it and by calling the attention of interested shooters to it, to the end that they become acquainted with it and ultimately subscribe.

Under its new title the rifleman's magazine will be bigger and better and will be equipped to serve the shooters and conserve their interests better than ever in its entire history. The new name should be permanent.

TWENTIETH CENTURY FLOBERTS

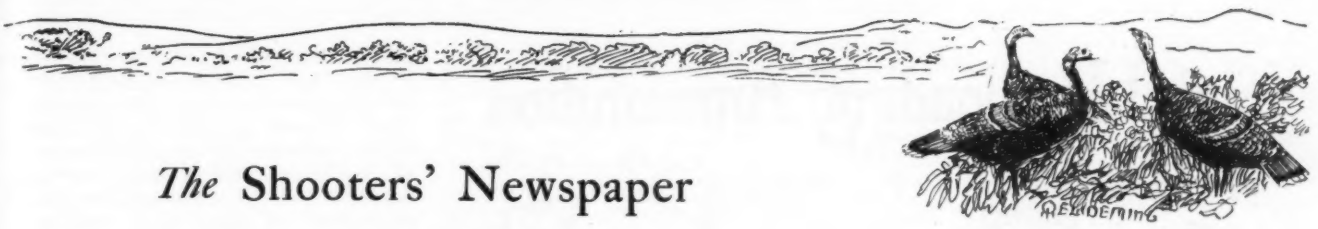
ONE of the largest importers of German "Trade Guns" has withdrawn his advertising from several of the leading sporting trade magazines on the ground that recent articles appearing in these and other periodicals have killed the sale of these goods.

THE AMERICAN RIFLEMAN is not directly concerned in this situation since its policy has been consistently to refuse to accept advertisements of this character, but it is a significant fact that the importers who have sought to exploit the American shooting fraternity are now seeking to stick a gun in the ribs of those publications whose editors have not hesitated to tell the truth concerning the inferior and often dangerous qualities of the post-war pot-metal rifles and pistols which are offered as genuine Mauser and Luger products.

The importer in question, in withdrawing his advertising, we are informed, professed to care little about the fate of the cheaper grades of sporting rifles and pistols, but said he had on hand about one thousand Mauser rifles which must be sold for about $100 each, and which could not be disposed of in the face of criticism which lumped all German goods under the heading of junk. Assuming that the one thousand Mausers which the dealer mentioned are honestly made, the situation remains unaltered. By producing the kind of firearms which have flooded the country since the war, the Germans themselves have discredited their former high-grade products, and it ill-behooves them now to whine when their fakes are unmasked, no matter what the result may be. The burden of deciding whether this or that Mauser rifle or Luger pistol is honest should not, and must not, be saddled upon the American buying public, a majority of whom are technically unqualified to detect the earmarks of unreliable assembly and cheap parts. This is especially true when a mistake in judgment on the part of the buyer involves not only the small pecuniary loss in the purchase price, but possibly serious bodily injury.

As usual, the German manufacturer and the importer of these "Synthetic Sporters" feel thoroughly abused and they are convinced that everyone who presumes to differ with them is hopelessly and benightedly wrong. However, in the long run, those publications actively fighting the sale of Hun junk in this country will be the gainers in the increased confidence of the shooting fraternity whose interests are being well looked after by every magazine that refuses such quack advertising.

There is nothing to marvel at in the present influx of the "near-beer" type of firearm. The older readers of sporting magazines readily will recall a similar period when foreign made junk, in the shape of the so-called Flobert rifles and pistols were offered throughout the country some thirty years ago. The "rat-and-cat" rifle and the parlor pistol were quite as familiar and as easily acquired then as the trade-gun junk is today; and the comparison between the Floberts and such honest American weapons as the Winchester, Stevens, Marlin, Colt, and Frank Wesson products was the same as between post-war junk and honest pre-war Mausers today. The Flobert enjoyed a brief popularity, but in a relatively short time the American buying public, even less well informed on firearm quality than at present, realized their inferiority and refused to waste good money on them.



The Shooters' Newspaper

EDITORS

BRIG. GEN. FRED H. PHILLIPS, Jr.
KENDRICK SCOFIELD
T. G. SAMWORTH

Entered as second class matter, April 1, 1908, at the postoffice at Washington, D.C., under the act of Congress of March 3, 1879

Obtainable by subscription, $3.00 per year. $2.00 to individuals or members of clubs affiliated with the N. R. A.
Canadian Subscription, $3.50. Foreign, $4.25

History is merely repeating itself. The post-war Mausers and Lugers are nothing more than Twentieth Century Floberts. It will not be long until every potential purchaser recognizes them for the worthless dangerous junk they are.

DO YOU "FIT IN?"

I WOULD like to know how I fit in at Perry. Is it intended only for riflemen who compete in the matches, or for anyone interested in rifle shooting, regardless of his ability? I think that the two weeks' course of instruction would benefit me, as it is easier to learn the right way at first than to receive instruction after you have practiced and formed your own opinions.

"I have been interested in rifles and rifle shooting for some time, but the character of my work has precluded any possibility of my obtaining any chance to shoot, so I am a raw amateur at the shooting game, with nothing but a lot of enthusiasm and love of it as a clean, manly sport."

That is an actual extract from a letter now lying on our desk. It might have been picked bodily from any one of scores of letters coming in. "Is Perry intended only for match riflemen or as a place for the rank amateurs who want to learn to shoot?" In that question and the answer to it lies the value of Perry to the riflemen of America and to the life of the game itself. The answer is self-evident from the regulations governing the eligibility for places on the teams sent to Camp Perry at Government expense, and the entire tone of the programs covering the NRA matches, not only at Camp Perry, but in the gallery and on the Outdoor Small Bore Range. At least one-half of every National Match Team must be made up of men who have never fired in a National Match before. Of the remaining half, no members may have participated in more than three of the preceding five matches. In every event on the program Tyro medals and cash prizes are in evidence. The School of Instruction is obviously conducted for the benefit of the amateur. The rifle shooting game is probably unique among sports in this, that the expert, as soon as he reaches that stage, is put to work teaching beginners. If he is not the sort of an expert who is willing to impart his knowledge to beginners, even at the expense of frequently giving up shooting himself, the game doesn't want him. Camp Perry is conducted not *for* the experts, but to *produce* experts. No matter how rank a beginner, if a sportsman is an American citizen, he "fits in."

This year, more than any preceding year, will be a meeting of newcomers at the matches, and they will be newcomers who have in the majority of instances paid their own expenses and attended the camp because they wanted to learn, because they have a "lot of enthusiasm and love for the game as a clean, manly sport," and those familiar with Perry know that these amateurs, amateurs no longer when they leave the Camp, will leave with a more firmly rooted enthusiasm and a greater respect for the game and the men in it.

If you are an American whose only Red tendency is toward red blood, you will fit in at Perry, and Perry will warm to you, put you through your paces, and send you home—a rifleman.

"I SEE IN THE PAPERS"

HOW many times during a week does that phrase serve as the introduction to your conversation? Next to the ever-convenient topic of the weather, "I see in the papers" serves to open more conversations than any other phrase in this country. How often in the past two months have you seen in the papers anything pertaining to the National and International Rifle Matches at Camp Perry in September? If you have not seen something at least once every week which will serve to set people talking, you are in a sense directly responsible. Dispatches over all press association wires have been sent out from Washington once, twice, or three times a week. News letters have been sent to all Adjutants General for publication in papers of their states, with such added local color as they see fit to add every week. The various feature story News Syndicates have put out numerous stories. If this material is not being published in your papers, it is because your editor does not realize that anyone in his community is interested in the subject. Newspapers want to publish news, they are not interested in propaganda. It is only by showing local editors that there are people among their readers who are interested in rifle shooting that the material being sent out may be considered as news instead of propaganda.

There are over 1,052,000 men and women in the United States in the ranks of organized rifle and pistol shooters. No one has attempted to estimate the number of unorganized shooters. Certainly local editors will want to serve these people with the sort of news they are interested in, but first they must be told the facts of the case.

Get in touch with your editors, and get everyone whom you know to be actively or casually interested in the sport to get after them. Letters are being received asking if there are going to be National Matches this year. Such a situation indicates but one thing. Individual members of the National Rifle Association and club secretaries are falling down on the job of acquainting local papers with the fact that information concerning the coming matches is really news, and that there are over a million organized rifle and pistol shooters in the country who consider the data as news.

Get on the job and see that your friends approach you once in a while with "I see in the papers" something about the most truly American sport of all—rifle shooting.

Handloading Ammunition

By J. R. Mattern

CHAPTER 17

Seating of Bullets

THE preceding articles in this series have dealt largely with the fundamentals of handloading of ammunition. They were intended to ground the work of the beginner in right principles, to the end that he would not attempt the impossible or maneuver himself unknowingly into danger by neglecting or underestimating the importance of little things. It is now necessary to dig deeper into ballistics for the benefit of the experienced handloader who wants to produce ammunition of more than ordinary quality.

On the desk lies a ballistic sheet from one of the firearms experimental stations. It deals with one particular powder. It has 22 columns, recording 22 separate facts about the loading and firing of each charge tried. It ought to have half a dozen more columns, for several vital facts are still not recorded. It gives two columns to seating depth of bullets and air space between powder charge and bullet, but it ought also to give diameter of those particular bullets used, over-all length of the loaded cartridge, and either length of bearing, or shape of the front parts of the bullets. All these details have their influence on the pressures developed, and on the accuracy and general success of the load.

It might go still farther with profit, and tell something of the tolerance of the rifle chamber in which the charges were fired, the length of the throating, or leed as it sometimes is called, the diameter of bore and grooves and even the number and width of lands in that barrel. These things, too, effect pressures and success of any combination of powder and bullet, and must be taken into account by the handloader who is interested in turning out quality ammunition.

In the complete tables of loads of which sections are published with these articles from time to time, there are more than nine hundred different charges. At first glance one would consider that such a lengthy list would contain every load of value in all calibers, and it does—in one sense—going back in some instances even to loads chiefly interesting for what they have done in the past, those capable of fine work in the event that a shooter wants to reconstruct conditions that prevailed in black powder days or during the early development period of smokeless powders.

Yet these tables contain only nine columns. They give you only nine facts about each load, against upwards of thirty facts that you need to know when you attempt intelligently to produce superior ammunition. To express the matter in another way as a means of bringing out the desired angle of view, the number of loads in a list that actually would cover the requirements of all individual rifles and revolvers of popular calibers would mount into the thousands. To bring the subject within grasping size it is necessary to generalize, to explain how shooters may feel their way from those nine hundred typical charges in the tables, to many more ultimate individual charges for their particular guns. The loads in the tables are representative loads. Enough different powder charges and different bullets are named, with pressures and velocities developed in certain guns, to show in general where a shooter is at. One can try them, watching cases, primers, accuracy and other indications of pressure and performance for hints of how they can be modified to advantage. That is the angle of view a handloader should be possessed by. A slavish follower of the letter of rules will be limited in results.

Farther along is a table giving the standard factory figures for over-all length of cartridge, the depth of the bullet in the case mouth, and the air space usually found in a considerable list of popular cartridges. These figures are subject to variation or tolerance. The Government, for instance, permits nine thousandths of an inch variation in over-all length of the standard Krag 30-40 cartridge, from 3.08 inches to 3.089 inches, and permits twenty thousandths of an inch variation in 30-1906 cartridge lengths, ranging from 3.319 inches minimum to 3.339 inches maximum length. Manufacturers of hunting ammunition usually permit themselves far greater range of variation, with corresponding lowering of standards of performance. Handloaders should permit themselves no variation at all—that is, in the sense of errors. The position of the front ends of their bullets should be governed entirely by the rifle throat and chamber, and the action in repeaters, while the rear ends of bullets certainly must be placed with some regard to the needs of the powder charge.

In loading the Western 100-grain bullet in 250 Savage, for instance, we are cautioned to seat the bullets to give a total length of 2.54 inches, instead of the 2.35 inches or less which apparently is standard with the 87-grain bullet. The action of the Savage rifle permits this increased length of cartridge; the throating of the rifle chambers, or most of them, permit it and give superior accuracy because of it, while the pressures of maximum charges of powder such as 35.5 grains of DuPont No. 16 are distinctly relieved and made more uniform.

Another illustration lies in a quotation from Maj. Townsend Whelen. While he was at the head of Frankford Arsenal, where he loaded great quantities of match ammunition, he said: "We get a decided increase in accuracy by increasing the over-all length of cartridges from standard to National Match length, and another decided increase in accuracy by further lengthening from National Match dimension to Palma over-all dimensions." The standard length referred to probably is 3.3 inches to 3.32 inches; the National Match length probably is 3.337 to 3.347 inches; and the Palma length is 3.35 to 3.36 inches. These figures apply to 150, 170 and 180-grain bullets. Springfield rifle magazines will hardly pass

cartridges longer than about 3.4 inches, air space and pressures being very carefully gauged by regulating the powder charges.

For ordinary results a handloader can insert a factory cartridge in his loading tool, and adjust the chamber until the bullet seating plunger comes up snugly against the point of the cartridge. To improve on "ordinary results" he usually should allow the bullet to project a little farther from the case than in factory ammunition, this in order to seat the front of the bullet bearing into the rifling. By so doing he trues up the prefiring alignment of the bullet with the axis of the bore, and he avoids bullet jump on firing.

For still better results, some investigation of your individual rifle is in order.

Insert a factory cartridge into the gun and close the action. With a rod, then, measure the precise distance from tip of bullet to muzzle of gun. Withdraw the loaded cartridge and drop in a jacketed bullet, and then measure as before from its tip to the muzzle, while holding the bullet up in the throat, against the lands, with a pencil. This measurement almost surely will be shorter than the previous one. It will represent the length of jump of bullet when you use factory ammunition, and also the amount of increase in over-all length of your cartridges required for the beginnings of finer accuracy.

In adjusting your tools for seating bullets, be governed accordingly. You may find rifles with as much as a half inch of jump. Good ones, however, have only .10-inch or even none at all.

If you wish further to check the chamber dimensions, in order to get an idea of the neck tolerances and the like, make a sulphur cast of the chamber as has been explained in ARMS AND THE MAN during past months, notably in the Amateur Gunsmith articles. It pays to ferret out these individual pecularities of rifles, and to prepare special ammunition to fit them. Recently a 38-55 rifle was calipered in the grooves. It was discovered to measure .382 instead of the standard .378-inch, hence required longer cartridges, and required larger powder charges than normal to develop normal velocity or normal pressure. An owner of a fine 32-40 rifle recently got a new nickel-steel barrel. He was very much surprised to find his cases extracting with difficulty and primers indicating excessive pressure when he used the identical charges long his standard in the old barrel. Examination showed the groove diameter to be smaller, the throat to be shorter, and the chamber tighter at rear, but larger in front than the old one. As a result he has to seat bullets deeper in cases than he used to, and has to use two or three grains less powder charge. He gets fine accuracy and pleasant shooting now, after learning the combination his new barrel required.

The 30-40 cartridge has been kept in a position of inferiority because all its rifles are throated for the long, 220-grain bullet, which except for shortest range work on the heaviest game is not equal to more modern .30-caliber projectiles. Handloaders who allow for the throat, seating their 180-grain bullets far out of the cases, to avoid the quarter-inch jump, can modernize this cartridge with strikingly good results. It is difficult to seat the 150-grain pointed bullets far enough forward to make them touch the lands. In some individual rifles is can be done, and when it is done, this light bullet gives fine accuracy. There are some 150-grain bullets available which are fatter or thicker up forward than usual. Naturally, they are better than others.

The Remington Company makes its Thomas pointed bullet of 172 grains for this cartridge. This Thomas bullet has a peculiar straight-taper point, and a longer bearing than most pointed bullets, hence does not need to be seated so shallowly in the case mouth. I have bought factory ammunition with it loaded so far out, however, that the over-all length of the cartridges was too great to allow them to pass through a Krag magazine. That over-all length is a troublesome factor in the 30-40 with pointed bullets. Bullets of 220-grain weight are usually made *now* with a smaller forward portion which will go into the short throat of 30-1906 rifles chambered for the 150-grain pointed bullet. When such bullets are loaded into long-throated Krag chambers, they of course have to jump before they find the rifling lands, the same as a deeply seated pointed bullet. Very good results are obtained in all Winchester rifles and in many Krags with the 180-grain bullet seated just as far out as the magazine will permit, while for strictly target shooting, the Krag being used as a single loader, exceptional accuracy can be obtained by loading 180-grain Lubaloy bullets, at least to an over-all length of about 3.4-inches for the average Krag rifle.

The 30-1906 rifles nearly all are chambered and throated much closer the dimensions of their best bullets, but all through the list of popular hunting cartridges the conditions are more like those of the Krag. Investigating shooters will find loose chambers and long throats the rule. In seating bullets for superior accuracy, one in many instances will have to ignore the crimping groove on jacketed bullets, and locate the bullet in or out according to the ends of its bearing. Grooves are placed on jacketed bullets more, anyhow, to help them mushroom in front while holding together behind.

"Density of loading" is a term which does not always mean air space between powder charge and bullet in a cartridge case. In fact, the ballistic sheets have some figures of density which are preceded by a minus sign—they indicate that the powder was compressed by the bullet.

Now, smokeless powder charges as correctly determined by chronograph and pressure gun usually do not quite fill their cases, but a few of the most modern do fill cases up to or beyond correct position for bullet base in most rifles. The tables of loads can be trusted in that particular. You need not hesitate to seat a bullet correctly for the gun chamber because it presses the powder a bit, provided you find the charge in the tables. A cartridge case never gets smaller than the factory left it, except from corrosion or denting. It often gets larger, from expansion in loose chambers, after which it will develop less pressure rather than more from any given load.

Density of loading, however, is a live and active feature in the generation of pressure. A handloader must assume no general rule, but must be guided by actual maximum figures furnished him. He might be safe so far as pressure was concerned to cram into a 250-3,000 all the No. 16 powder he could get in without the grains being crushed when the bullet was seated correctly—when using an 86 or 87-grain bullet. But when using a bullet weighing 100 grains or 117 grains in this or any other .25 caliber case, he would be getting into extreme danger by so doing.

We can not foretell the effect of increasing density in any cartridge. If a bullet is pressed too deeply down against a heavy charge of smokeless powder, particularly a heavy, large or very hard bullet, that charge will behave in a different way than it did with normal air space. Its burning may become erratic, may even reach and pass the sharply defined border between safe, controlled "explosion" and wild, destructive detonation. It follows that the preventing of the base of the bullet from going too far into the case is as important on the score of pressure as is the presenting of the front of the bullet against the rifle lands on the score of accuracy.

Always leave smokeless powder charges loose in their cases. Do not "monkey" with wads or filling materials. If reduced loads show a tendency to hang fire on account of excessive air space, teach yourself to tilt the muzzle of the gun upward just before aiming, which will remedy that trouble.

Cast bullets are of many shapes. When using them, we are liable to get a diameter that will bear on the lands anywhere from close behind the tip back to the last band at the base. In seating them, a handloader must be guided by that bearing. Usually it is best to load them so that the lands of the particular gun will print into the alloy a little—not enough to make the bullet stick, yet distinctly to align it in the bore.

Very long bullets, thick in front, may have to be seated in cases quite deeply. Very short bullets, or those with spitzer or tapering fronts, may have to be seated quite shallowly. And some bullets with short bearing will not shoot accurately in guns of their caliber which have long throats, because they can not be seated to avoid a lengthy free jump before getting into the rifling. The 86-grain bullets are somewhat open to the objection when used in 25-35 rifles, which are chambered for 117-grain bullets; also the 32-20 and vari-

ous short revolver bullets when used in 30-40 and 30-1906.

Hunting ammunition should have bullets seated deeply enough, if possible, to get the lubricated grooves covered by the case. If one bullet will not do this, while bearing on the lands forward when chambered in the barrel, perhaps another one will.

In strictly target ammunition, where cartridges can be picked one at a time from boxes and inserted in the breach, cast bullets often are merely started in the mouths of cases. The idea is to permit them to find their own forward bearing in the throat and lands of the gun, after which the rifle action can force the case over their bases as far as required to close the bolt. There is much to be said for this plan. Some important matches have been won with such ammunition and loading. However, all cases have to be clean, and absolutely must be sized uniformly to receive the bullets with just exactly the right friction.

The following table gives standard dimensions for cartridges, usually when loaded with jacketed bullets, except in certain revolver cartridges. The air space, of course, varies with kind of powder and lot.

Cartridge	Over All Length *inches*	Depth Bullet Seated *inch*	Air Space *inch*
22 S.H.P.	2.435	.35	.15
25-37-117	2.542	.45	.40
25 Rimless-117	2.60	.475	.325
250-3000-87	2.35	.225	.20
30-30-170	2.8	.475	.15
30 Rimless-170	2.515	.500	.075
30-40-220	3.089	.225	.025
30-40-150	3.125	---	---
30-06-150	3.333	.475	.35
303 Savage-190	2.375	.475	.05
303 British	2.91	.425	.05
32 Special	2.575	.400	.10
32-40	2.488	.500	.35
32 Rimless	2.378	.400	.05
33 Winchester	2.788	.350	.35
35 Rimless	2.514	.325	.075
35 Winchester	3.000	.400	.15
38-55	2.55	.55	.20
405 Winchester	3.129	.425	.05
45-70 W.H.V.	2.47	.400	.025
45-90	2.75	.400	.20
7 m.m.	2.84	.20	.375
7.65 m.m	2.875	.20	.20
7.62 m.m R.	3.05	.225	.175
8 m.m. Mann	3.10	.100	.375
9 m.m. Mann	2.93	.375	.300
256 Newton	3.253		
280 Rose	3.45		
30 Newton	3.34		
25 A.C.P.	.905	.15	
30 Luger	1.165	.25	
32 S&W Long	1.257	.25	
32 A.C.P.	.977	.125	
32-20 Colt	1.581	.275	
32 Short	1.013	.125	
38 Long Colt	1.364	.35	
38 A.C.P.	1.257	.175	
38 S&W	1.189	.275	
38 S&W Spec.	1.547	.275	
380 Savage	.977		
38-40 Colt	1.591	.325	
41 Colt Long	1.383	.45	
44-40 Colt	1.588	.30	
44 S&W Spec.	1.593	.40	
44 Russian	1.422	.35	
45 Colt	1.573	.40	
45 A.C.P.	1.270	.275	

For a gun with a short throat—that is, one in which the rifling seems to extend back farther toward the chamber—bullets should be seated a little deeper in their cases, hence density of loading is greater, and powder charges should be *decreased* correspondingly. For a gun with a long throat, bullets being seated farther out and density of loading being less, powder charges often may be *slightly increased* to correspond.

Old guns, eroded in front of the chamber, require shallower and shallower seating of bullets, and more and more increase of normal powder charges, to develop standard or table velocities in them.

In Chapter 10, on cartridge cases, the matter of resizing was discussed. Here it is well to add that unless case necks are clean, and resizing done accurately, various complications will beset the efforts of handloaders when they attempt to seat bullets. *Correct resizing of case necks is vital.* For cast bullets, the inside diameter of necks should measure not smaller than a quarter of a thousandth less than the bullets. They had better be almost exactly as large as the bullets. For jacketed bullets, the Frankford Arsenal rule previously given is best. Thin, black powder cases will bend and buckle if necks are in the slightest too tight. Any cases will fatigue and split within a few months if too tight, besides which the cold working given brass in resizing excessively hardens it and makes it brittle.

Aside, however, from trouble with bending and splitting, there are other sufficient reasons why the necks of cases should be made exactly correct to take the bullets easily and hold them snugly, but not too hard. Bullet resistance helps to start the powder charge to burning adequately and uniformly. If one bullet goes into the case very hard, while the next is barely held, they will not shoot alike. One will fly higher then the other. A beginner may consider that a bullet is correctly seated if it does not actually drop out or go back against the powder, no matter how much the tension varies throughout a lot, but the experienced shooter demands uniformity in this particular, as in others. Eliminate the cases which by reason of thin metal or corrosion will not resize to your predetermined standard in your tools.

As a final word on seating bullets, a handloader must see that his case necks are not warped or bent out of line with the bodies of cases. Attempts to resize case necks in tools with too large holes near the head destroys the alignment of the necks as a whole. Attempts even to seat bullet in tools permitting the heads of the cases to push to a side results in "crosseyed" ammunition. Bullet held crooked in case necks will not be straightened or aligned with the axis of the bore, no matter if they do fit up into the throat and the rifling when chambered for firing. Sometimes in resizing, the brass appears weaker on one side of the case neck than the other, the die reduces the neck all on one side, with the result that the subsequently seated bullet may possibly point up the bore fairly straight, but lies off-center with the bore. This result also appears when any bullet is seated in a case neck much too small. The neck expands to take the bullet, but seldom uniformly all round—one side gives way first, allowing the whole cartridge to get out of concentric balance. Resizing of cases and seating of bullets are most intimately related, and one operation should be used to check the results of the other. The proper dies and tools, and care in their use, will insure very satisfactory results, but nothing much at all will be accomplished in poorly fitting tools or without intelligent care.

Flapjacks

(Concluded from page 7)

one side of the boulder. Lon snapped a shot at it, before he thought of it being his last cartridge. He recalled he had the derringer as two bullets sang past. Lon lurched to his feet and rushed over the boulders. The man saw him coming and feverishly placed the last shell in the three-shell clip. He jammed it into the cylinder and snapped down on the approaching Lon.

Lon jumped to one side and the hammer fell on an empty chamber. Lon fired with top barrel of derringer but missed at less than 10 feet. The man snapped on an empty chamber and Lon fired his last shot. The blunt, soft lead bullet struck the man's 'left arm as he yanked the trigger of double-action gun again. Lon ducked and felt the wind of the passing bullet. He threw his now useless derringer at the snarling face and grappled.

The man attempted to dodge the derringer and Lon's shoulder struck the unprotected throat and they went down together. Lon's shoulder had flattened the man's trachea and he was gasping for breath when Lon turned him over. It was then he discovered that his prisoner's left arm was broken.

As Lon rode out of the canon with his prisoner marching ahead of him, Stone Davis and Thomas rode up on his trail.

"Good!" said Stone, "You got 'im."

"Ye-ah," drawled Lon. Then to Thomas, "Give me my gun."

"I think I owe you an apology, Mr. Furguson——"

"Sall right—thanks." Then turning to the prisoner, "What'd you kill Peters for?"

"Thought he was a deputy notified to head me off," growled the man. "And you'd never got me if it wasn't for them damned clips!"

"Hell! You don't savvy your sixshooter. Look here," and Lon held out the prisoner's gun. You didn't need them fool clips a tall. There's a shoulder in the chambers to keep the shells from going too far in for the firing-pin to reach. Course the darned thing won't eject but you can shake 'em out, or pull 'em out with your fingers. An' if one sticks you can pry it out with the shoulder of a live shell."

"I didn't know that——"

"That's the trouble with a lot of folks—they don't take time to savvy their gun."

"It was the jailer's," said the prisoner, as though apologizing.

Lon Ferguson does not as a rule, have flapjacks for supper. But you know how it is. When you want flapjacks and maple syrup, nothing else seems to hit the spot. As Lon reached out with his right hand and flipped the flapjack in the frying pan he reached for the syrup can with his left—and heard a horse rattle an empty saddle. Then he went out and unsaddled Al Peters' horse.

Individual Instruction in Rifle Practice

By Col. A. J. Macnab, U. S. A.

PART 3

21. *Positions in standing trench.* *a.* These positions will vary according to the style of trench and build of the man. In general, it is a good plan to have as many points of support for the body and arms as possible.

In a trench that has no berm for the left elbow the position is the normal standing position. The left hand is placed against the top of the parapet and the rifle, just beyond the hand, rests on the parapet. With the berm, the position is about the same except that the left elbow rests on the berm. When the berm is wide enough, as it often is, both elbows can be rested on it, in which case the position of the upper part of the body is about the same as in the prone position with the sand-bag rest.

b. In all positions in a trench, the soldier should lean well against the butt of the rifle to insure firmness and steadiness.

22. *Position exercise.* Instruction in positions is the second step in the preparatory training and is conducted as follows:

a. The instructor assembles his squad or group, shows them the proper method of blackening the front and rear sights of the rifle and has each pupil blacken his sights.

b. The instructor explains and demonstrates the "hasty" sling adjustment and assists each pupil to adjust his sling. He explains the "loop" sling adjustment and assists each pupil to adjust his sling.

c. The instructor explains and demonstrates the proper manner of taking up the slack and has each pupil practice it.

d. The instructor explains and demonstrates the proper manner of holding the breath and has each pupil practice it.

e. The instructor explains and demonstrates the use of the aiming device.

f. The instructor explains the general rules which apply to all positions.

g. The instructor explains and demonstrates the prone position, prone position with sand-bag rest, sitting, kneeling and standing position. He has each pupil assume each of these positions and corrects any errors that exist.

h. The above points having been shown to the assembled group, the instruction becomes individual by the coach and pupil method supervised by the instructor. Small aiming bull's-eyes are used for this instruction. These bull's-eyes must be placed at different heights so that in aiming from the various positions the rifle will be horizontal.

23. *Duties of the coach in position exercises.* In the position exercises the coach watches the following points:

Plate 12
Kneeling Position

a. That the sights are blackened.

b. That the gun sling is properly adjusted, is tight enough to give support and is high up on the arm.

c. That the proper position is taken.

d. That the slack is taken up promptly.

e. That the aim is correct.

f. That the breath is held while aiming. As soon as the aim becomes unsteady the exercises cease and after a short rest are repeated. The coach checks the pupil's aim occasionally by means of the aiming device, and the pupil's manner of holding his breath by watching his back. The trigger is not squeezed in the position exercises.

24. *Assuming the prone position rapidly* (see Plate XIV):

a. The movement is described by the numbers for the purpose of instruction in the sequence of movement. After this sequence is learned, the position will be taken in one motion. With practice, men can take the prone position and be aiming at the target in three seconds.

(1) Beginning at the "ready," sling adjusted, throw the right foot well back and

Plate 13
Standing position

Plate 14
Assuming the prone position

bend left knee as low as possible, placing the butt of the rifle on the ground 4 or 5 inches to the left, and slightly in front of the spot where the right elbow is to rest. The grip on the rifle is retained with both hands.

(2) Place the right elbow on the ground.

(3) Place the left leg back near the right one, feet apart, and slide well back while lying on the belly.

(4) Take the butt of the rifle off the ground and place it against the right shoulder.

(5) Lower the left elbow to the ground.

b. These movements will bring the firer into his normal position, with the rifle pointing at the target. Care should be taken to place the butt of the rifle on the ground without jar and to place the elbows on the ground in the same manner. With practice, this position can be assumed very rapidly and without shock.

c. When the details of this movement have been learned, it should be practiced as one movement. When properly done the feet will still be sliding back into position when the rifle is being placed on the shoulder, and the left elbow will come to the ground at almost the same time that the backward movement of the body is completed.

d. The ability to assume this position rapidly is a distinct advantage in war because a man can thus fire an aimed shot more quickly than if he remained standing. The position also reduces the enemy's target from a standing to a prone figure. Instruction in taking positions rapidly will be given during the period of preparatory training.

25. *Assuming the sitting position rapidly.* *a.* To assume the sitting position rapidly, break the fall by placing the right hand on the ground slightly to the right rear of the spot on which to sit.

b. In practicing for range firing, first sit down and aim at the target in the normal sitting position. Then mark the position of the heels and the spot on which to sit. Then at the command, "ready on the firing line," stand with the heels in the places made for them. As the target appears, sit down on the spot marked, breaking the fall with the right hand, regrasp the small of the stock with the right hand and assume the aiming position.

c. Other methods of assuming the sitting position may be used.

SECTION IV

Third Step, Trigger Squeeze

26. *Importance.* *a.* The most important item in rifle shooting is to squeeze the trigger in such a way as to fire the rifle without affecting the aim. The trigger must be squeezed so steadily that the firer cannot know the instant the piece will be fired. Any man can hold the rifle steadily enough to fire a good shot, and he can so hold it for a comparatively long time. Misses and poor shots are due to spoiling the aim just before the discharge takes place. This is done by jerking the trigger and flinching. If a man squeezes the trigger so steadily that he cannot know when the discharge will take place, he does not spoil his aim and he will not flinch, because he does not know when to flinch.

b. No good shot attempts to set the rifle off at any instant at which his sights are aligned on the mark. That is what the poor shot does. The good shot holds his aim as accurately aligned on the mark as possible and maintains a steady pressure upon the trigger until the piece is fired. This method of squeezing the trigger must be carried out in all preparatory practice or the whole value of the practice is lost.

c. There is only one correct method of squeezing the trigger—a steady increase of pressure so that the firer does not know when the discharge will take place.

d. Excellent shots are men who, through training, have learned to increase the pressure only when the sights are in absolute alignment with the bull's-eye. When the

Plate 14—Continued

sights get slightly out of alignment, they hold what they have with the finger and only go on with the increase of pressure when the sights again become properly aligned.

e. The difference between poor shots and good shots, good shots and very good shots, and very good shots and excellent shots is only the difference in their ability to squeeze the trigger properly. The heart and soul, the beginning and end of good shooting, is the trigger squeeze. Any man with fair eyesight and strength enough to be on duty can align the sights on the target and hold them there for an appreciable length of time. When he has acquired sufficient will power and self-control to forget that there is to be an explosion and a shock, and squeezes the trigger with a steady increase of pressure until the rifle is fired, he has become a good shot, and not until then. This squeeze of the trigger applies to rapid fire as well as slow fire. The increase of pressure is faster in rapid fire, but the process is the same.

27. *Calling the shot.*—The pupil must always notice where the sights are pointed at the instant the rifle is fired and call out at once where he thinks the bullet will hit. Shots are called even when only simulating fire at a mark, so as to acquire the habit and to develop a closer hold.

No man can become a good shot until he is able to call his shot before it is marked. Inability to call a shot indicates the firer did not know where the sights were pointing at the time the rifle was fired; in other words, he shut his eyes first and fired afterwards.

28. *Trigger squeeze exercise. a.* The third step in the preparatory training, and the most important, is the instruction in trigger squeeze.

(1) The instructor explains to the assembled squad or group the importance of correct trigger squeeze (see par. 26). He assures himself by questions that each pupil understands what is meant by a "steady increase of pressure," that is, that the increase is only applied when the aim is correct and then by a steady increase and not by a sudden pressure.

(2) The instructor explains the necessity for calling the shot (see par. 27).

(3) The above points having been explained, the instruction becomes individual by the coach and pupil method, supervised by the instructor.

b. The pupil is first taught the trigger squeeze in the prone position with the sand-bag rest. In this position he can hold steadily and has not the temptation to "snap" the shot the instant the front sight touches the bull's-eye, as he has in a less steady position. After he has learned the principles of correct trigger squeeze with the sand-bag rest, he is instructed in the other positions, but for the first half day at least he is not allowed to squeeze the trigger except in the prone position, first with, and then without, the sand-bag rest.

c. A great deal of trigger squeeze exercise is necessary, but it must be carefully watched and coached. Trigger squeeze exercise that is not along the right lines is worse than none.

d. Soldiers will not be allowed to simulate fire until they have been thoroughly instructed in trigger squeeze. Then in all drills and field exercises where fire is simulated, they will be cautioned to aim at definite objects and to carry out the correct principles of aiming, squeezing the trigger and calling the shot. Careless trigger squeezing in field exercises may injure a solder's chance of becoming a good shot.

29. *Duties of the coach in trigger squeeze exercise.*—In the trigger squeeze exercises the coach watches the following points:

a. That the sights are blackened.

b. That the gun sling is properly adjusted; is tight enough to give support and is high up on the arm.

c. That the proper position is taken.

d. That the slack is taken up promptly.

e. That the aim is correct.

f. That the breath is held while aiming.

g. That the trigger is squeezed properly (only when the aim is correct and then only by a steady pressure).

h. That the pupil calls the shot. The coach occasionally checks the aim by means of the aiming device and the breathing by watching the back of the pupil under instruction.

SECTION V

Fourth Step, Rapid Fire

30. *General principles. a.* All the points learned in slow fire are carried out in rapid fire. It is especially important that the men understand that the trigger squeeze is the same as in slow fire. Time is gained by reloading the magazine quickly and without fumbling, by working the bolt rapidly and by keeping the eye on the target while working the bolt.

b. The importance of correct rapid-fire training can not be too strongly emphasized. This is a phase of instruction that is often neglected. Rapid fire does not mean that accuracy is sacrificed for rapidity. Through training, accurate fire becomes more and more rapid until the ability to fire from 10 to 15 accurate shots per minute is acquired, but no man will be permitted to attempt to fire more than 10 shots per minute until he has had long training on the rifle range and has become a seasoned shot. Recruits having target practice for the first time will not be reprimanded for failing to fire the prescribed number of rounds in the stated time limit. It is advisable to extend the time 10 or 15 seconds for recruits when they first begin rapid-fire practice on the range.

c. Careful coaching is essential to prevent acquiring the habit of looking into the chamber while working the bolt. The man who looks into the chamber works the bolt slowly so as to see the cartridge run in. He loses time in finding his own target again. He often fires on the wrong target. The application in war is apparent. A soldier who takes his eye off an indistinct target to look into the chamber while working the bolt may not be able to find his target again.

d. Training for rapid fire extends throughout the year. This training is accomplished by requiring all simulation of fire during problems and maneuvers to be carried out along the proper lines.

e. Rapid-fire exercises are given under conditions conforming as nearly as possible to those of actual range practice. Full-sized targets are placed at 200, 300 and 500 yards from the men under instruction with some simple arrangement permitting the target to be exposed to view for the prescribed period of time. A curtain of target cloth or other material may be arranged on each target frame in such a way that it can be dropped to expose the face of the target, and pulled up again to conceal it. A cord which runs over the top of the target frame may be used for this purpose.

f. When lack of time, material, or space make it absolutely necessary, the rapid-fire exercises may be held at shorter ranges and on targets proportionately reduced in size. This practice as well as all other preparatory exercises can be held indoors when weather conditions make it necessary.

31. *Bolt operation exercise. a.* This exercise is held for the purpose of acquiring a smooth and rapid bolt operation, and the trigger is not pressed. The trigger is tied back to the trigger guard in order to cause the bolt action to be the same as it is when the trigger has been pressed. If the trigger is not thus tied, the piece will remain cocked when the bolt is shoved home, and the amount of force necessary to raise the bolt again will be less than when actually firing or simulating fire.

b. Practice in bolt operation exercise will be held in all positions and no pupil will be considered proficient until he can operate the bolt at least 20 times in 20 seconds while in the prone position. The first hour of rapid-fire training will be devoted to bolt operation exercises. Thereafter, each pupil will be given additional practice from time to time until he is considered proficient.

c. The bolt operation exercise is conducted as follows:

(1) The instructor places his squad or group in line, has each man tie the trigger to the back of the trigger guard and explains why this is done.

(2) The instructor explains and demonstrates that the bolt is jerked fully back and slammed home with practically one motion, instead of by four distinct motions, as men are inclined to do at first.

(3) The instructor demonstrates the bolt-operation exercise, emphasizing the duties of the coach as outlined in paragraph 32.

(4) The above points having been explained, the instructor places his squad or group in line, arranged in pairs to act as coach and pupil, requires the pupils to assume a firing position and personally gives the commands for starting and stopping the exercise. Frequent changes of coach and pupil are necessary to prevent undue fatigue.

32. *Duties of the coach in bolt operation*

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exercise.—In the bolt operation exercise the coach watches the following points:

a. That the bolt is operated properly and rapidly.

b. That the eye is kept on the target.

c. That the right hand is brought to the small of the stock, the rifle to a horizontal position, and the cheek placed against the stock each time the bolt is closed.

d. That the butt of the rifle is kept against the shoulder.

e. That the elbows are kept on the ground if in the prone position, or between the legs if in the sitting position.

f. That no attempt is made to aim or press the trigger.

33. *Rapid-fire exercise.* *a.* The instructor assembles his squad or group and explains and demonstrates:

(1) The correct method of loading a clip of ammunition into the magazine, using dummy cartridges for the demonstration. He explains that the ball of the thumb is placed on the powder space of the upper cartridge very close to the clip, with the fingers under the rifle against the floor plate, the cartridges being shoved into the magazine with a firm, steady push. The empty clip is removed by the right hand.

(2) The working of the bolt while in the prone position, keeping both elbows on the ground and allowing the muzzle to drop down and to the right. The working of the bolt in the sitting position, keeping both elbows between the legs and allowing the muzzle to drop down and to the right.

(3) The disadvantage of looking into the chamber while working the bolt and of looking into the magazine to see if there are any more cartridges left.

(4) That the follower holds the bolt back when the magazine is empty and that the eye is never taken from the target until the follower holds the bolt, except when a man has counted the shots fired and knows that his magazine is empty.

(5) That the butt of the rifle is never taken from the shoulder when working the bolt.

(6) That a quiet, confident movement of the hand in taking the clip from the bolt and placing it in the clip slot is really more rapid than a hurried movement and avoids the chance of fumbling, which usually accompanies hurried movements.

b. The above points having been explained and demonstrated, the instructor places his squad or group in line and arranges in pairs so as to act as coach and pupil. The commands and procedure are exactly the same as in actual rapid fire on the rifle range, except that practice dummy ammunition is used. Rapid fire targets set at 200, 300 and 500 yards from the line of pupils are exposed to view for the proper interval of time, upon signals from the instructor in charge of the line. Sights are set at the actual range being used (see par. 30-e).

c. Practice dummy ammunition only will be used in this exercise. The use of range dummy ammunition except on the firing line is prohibited.

34. *Duties of the coach in rapid-fire exercise.* *a.* In a rapid-fire exercise, the coach watches the following points:

(1) That the sights are blackened.

(2) That the gun sling is properly adjusted.

(3) That the correct position is taken.

(4) That the slack is taken up promptly.

(5) That the breath is held while aiming.

(6) That the trigger is squeezed properly.

(7) That the bolt is worked rapidly and that the eye is kept on the target, the elbows kept in place and the butt of the rifle kept to the shoulder while working the bolt.

(8) That the magazine is reloaded quickly and without fumbling.

b. The coach must be alert and correct all errors.

SECTION VI

Nomenclature, Care and Cleaning of the Rifle

35. *Nomenclature of the rifle* (see Plates XV and XVI).

a. The following parts will be pointed out and the functions of each explained: Stock, butt, breech, hand guard, upper and lower bands, barrel, muzzle, bore, front sight, rear sight, sight leaf, leaf slide, sight graduations, wind gauge, windage screw, cut-off, extractor, ejector, cocking piece, main spring, firing pin, striker, cocking cams, safety lock, trigger, trigger guard, guard screws, receiver, magazine, floor plate, magazine spring and follower.

b. A knowledge of the names of the parts habitually referred to in drill and target practice is all that is necessary.

36. *Importance of proper care.*—The rifle is a piece of fine mechanism. It must be kept clean, free from rust and well lubricated if it is to do good work and remain in serviceable condition. The cleaning and care of the rifle is an important duty to be performed by all soldiers armed with this weapon, and a subject which merits the serious consideration of all officers. Experience has shown that the majority of rifles become unserviceable, not through shooting, but through the lack of care, or the lack of intelligent and proper care.

37. *Inspections.*—At all inspections, unless otherwise explicitly ordered, the rifles will be clean, the bore of the rifle will be protected with a thin film of grease (cosmic), the mechanism of the rifle will be lubricated with thin oil (sperm oil), and the oiler will be filled with oil. When the inspector wishes to inspect the rifles minutely, he may order that all grease and oil be removed from them, but in such cases the grease and oil will be applied again immediately after the inspection, and the inspector will allot a specific time for so doing.

38. *Care and cleaning in garrison.* *a.* This includes the ordinary care of the rifle to preserve its condition and appearance in garrisons, posts, and camps, during those periods when no firing is done.

b. To clean the rifle, rub it off with a rag which has been slightly oiled or greased and then clean with a perfectly dry rag. Swab the bore with an oily flannel patch and then with a perfectly dry one. Dust all screw heads out and crevices with a small, clean brush. Wipe off the stock and sling with an oily rag and then with a perfectly dry one.

c. Immediately after cleaning, to protect the rifle, swab the bore thoroughly with a flannel patch saturated with grease (cosmic), wipe over all metal parts including the bolt mechanism and magazine with an oily rag, apply a few drops of light oil (sperm oil) to all cams and working surfaces of the mechanism, place a teaspoonful of linseed oil in the palm of the hand and polish the stock well.

d. After cleaning and protecting the rifle, place it in the gunrack without any covering whatever. The use of canvas or similar covers for the rifle is prohibited as they collect moisture and rust the metal parts. When the barracks are being swept, gunracks may be covered with a piece of canvas to protect the rifles from dust.

e. Damp air, and, particularly sweaty hands are great promoters of rust. The rifle should be cleaned and protected after every

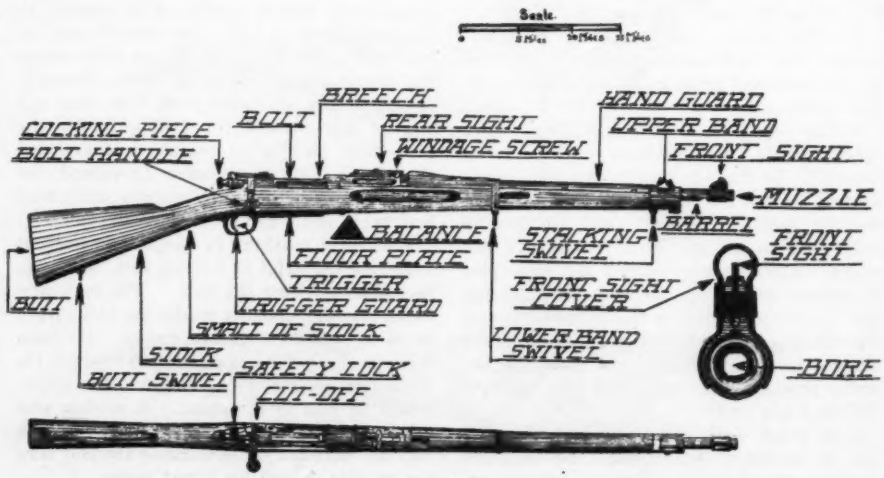

Plate 15

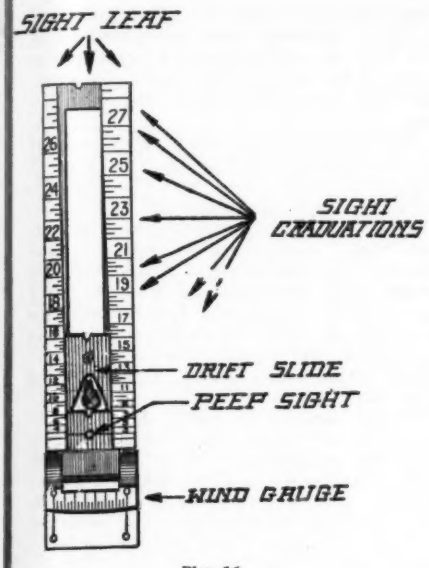

Plate 16

drill. Special precautions are necessary when the rifles have been used on rainy days and after tours of guard duty.

f. The barrack cleaning rod only will be used. The use of the thong and brush will not be confined to occasions when the barrack cleaning rod is not available. Rifles will always be cleaned from the breech, the bolt removed during cleaning for this purpose.

g. The following parts of the rifle may be removed by the soldier for the purpose of cleaning: Front sight cover; floor plate and follower; gun sling; oiler and thong case, and the bolt, which may be taken apart.

39. *Care and cleaning after firing.* *a.* When a rifle has been fired the bore must be thoroughly cleaned not later than the evening of the day on which it is fired. Thereafter, it must be wiped out and regreased each day for the next three succeeding days at least.

b. Cleaning the bore of a rifle after firing involves three operations:

(1) Removing the powder residue in the bore with water, preferably warm, or with any of the commercial powder solvents.

(2) Drying the bore thoroughly of the liquid used to remove the powder residue, by running a number of cleaning patches through the bore.

(3) Protecting the bore against rust with a coating of grease by running a cleaning patch saturated with grease through the bore two or more times.

c. Metal fouling (small flakes of bright metal seen in the bore after it has been thoroughly cleaned) will be removed only by an instructor, non-commissioned officer or mechanic. Supply sergeants, mechanics and selected non-commissioned officers will be instructed in the method of removing metal fouling, as explained in T. R. No. 320-10. Metal fouling will be removed as soon as discovered. All rifles will be inspected for metal fouling at the end of any period of firing.

d. During range firing a non-commissioned officer will be placed in charge of the cleaning of rifles at the cleaning racks.

40. *Rules for the care of the rifle on the range.*

a. Wipe out the bore with a clean cloth patch each time before going to the firing point.

b. Always clean at the end of each day's shooting. A rifle that has been fired should never be left overnight without cleaning.

c. Never fire a rifle with any dust, dirt, mud or snow in the bore.

d. Never leave a patch, oil rag, cork or other obstruction in the bore or anything sticking into the muzzle.

(To be continued)

Real Targets for Your Pet .22

By Frank Ridgeway

WHILE the .22 caliber is given credit for nothing larger than sparrows, there are two real pests for which it cannot be beat.

First of these is the blue jay. A greater destroyer of our song birds never lived. He doesn't kill them for food either, but from pure cussedness most of the time. I have found him killing the young of a pair of robins, and after his butchery was finished would fly away and leave them. What always seemed strange to me was, that while a robin is almost as large, they don't seem to be able to drive him away; in fact, I have never seen them really attack him, simply make a lot of fuss, but no bite.

The blue jay has been my favorite target for a good many years, for when a small boy of ten or twelve years, I found one trying his best to get at a nest of wrens in a hole in one of the logs in the loghouse where I was raised. Ever since then I use him for a bullet stop when ever I get a chance, and a .22 L. R. hollow point does the work.

Next is the crow, and contrary to all rifle dope I find the .22 L. R., in a good, heavy target rifle the best that can be used for him. At ranges up to 100 yards, with a real accurate rifle and scope, you should be able to get him nine out of ten shots, and if well concealed the noise from the rifle does not seem to bother him.

The crow will decoy with excellent results and half days of good shooting can be had.

A mounted hawk or owl makes the best decoy, for they seem to have a natural hatred of them and will take all kinds of chances just to get one rap at him. If you can locate a crow's nest in a timber lot just put your decoy, hawk or owl, up in some thick bushy top not too high from the ground, build a good, comfortable blind if a natural one cannot be found, and await results.

The game can be hurried along by the careful use of a call, but use it sparingly, as a crow is wise, and while he may not be able to talk like a parrot, he sure can see in the future, so I guess it is a good thing he can't talk.

My favorite way is to find a place where I can sit with my back against a log or stump, getting two or three trees having a few dead limbs in their tops in view and not to exceed 150 yards range, then wait.

Make one or two calls and you will likely see an old crow sailing around high up in the air. That's all it takes, the sharp eyes will soon discover your decoy, and in a few minutes the air will be full of crows.

Now, your fun begins and if you get one or two cripples on the ground it adds considerable to the sport.

By keeping yourself well concealed so they do not see you the more you can shoot until tired and still have shooting left, as the report of the .22 does not seem to disturb them.

For this reason be sure and make yourself comfortable before the fun begins, for if you get in a cramped position you just have to move after awhile, that's all, and when they once locate you it's over, so far as that day is concerned, for they can judge distance just as good or better than you can, or so it seems, for they will stay just out of range.

I tried a 250 Savage on which I had a scope for this kind of shooting, but while it gave me a little longer range I could not get near as many shots at the short ranges, therefore, didn't get as many crows, because at 200 yards or over the group made by the 250 misses lots of crows if you hold the same all the time, then add a few misses for poor holding and your hits are very few.

Unlike hunting the game birds, do not give the crow any chance whatever if you can help it, for the crow destroys in one summer more quails than is killed by all the sportsmen together, and he has no closed season either.

Now, I have gone over my way of hunting them. I am going to give you another idea which I have never tried, but will try this summer, as the party describing it to me has extended the invitation and it sounds too good to miss.

He has two young crows taken from a nest last year, and raised as pets around the house. His idea is to put a light aluminum band and chain on them and use them for decoys. Sounds like it might be the best yet. If any of you have ever tried this let's hear from you as to results.

If you never tried this game, now is the time to begin. You don't have to tote your heavy rifle around all day, just drive Lizzie up to most any woods lot and get to business. The farmers are only too glad to see you come when they find out what you are doing, and you always have a standing invitation to come back.

Besides, if you get well enough acquainted and kill enough crows he may decide to let you hunt a few cottontails or bob whites this fall when the season opens, who knows?

Concerning the Match at Annapolis

By C. B. Lister

NOT by any means the largest, but by all odds one of the most important military rifle matches of the year, was fired on the Naval Academy range at Annapolis, Saturday, May 12. Teams representing the Naval Academy, George Washington University, of Washington, D. C., University of Pennsylvania, Cornell, Syracuse, and Georgetown University, participated. The conditions called for six-man teams, ten shots, 200 yards, slow-fire standing; ten shots, 200 yards, rapid-fire, target A, sitting from standing; ten shots, 300 yards, rapid-fire, target A, prone from standing; and twenty shots, 600 yards, slow-fire, target B. The match was won by the Navy Blue Team, with the George Washington University second, and the Navy Gold Team third.

The Navy entered two teams, as did Georgetown University, so that eight teams faced the targets at 11.30 a. m., Saturday morning. Pennsylvania, Syracuse, and Cornell went to Annapolis Friday night and were put up in the midshipmens' barracks. Indications pointed to an interesting match from the start, in view of the fact that Major L. W. T. Waller, of International Team reputation, was coaching Pennsylvania; Commander Denny, a member of the International Team in 1921-22, had charge of the Naval Academy riflemen; and Walter Stokes was coaching and firing with the George Washington squad.

None of the teams, with the exception of the Naval Academy, have the facilities on their home ranges for practice with the military Springfield, under the conditions of the match, so that the result was a clear indication of the value of gallery work with the .22 rifle as training for range work with the .30. Commander Denny and his right-hand man, Midshipman Casson, had the machinery well oiled, and there was no hitch after the teams arrived on the range. The wind was blowing in gusts, running up to twenty miles an hour from three o'clock, and shooting started in a light-showered rain. Conditions were far from favorable for offhand scores, but to the credit of the college men and their .22 training, be it said that Three's and Two's were conspicuous by their absence. The Navy Blue Team turned in 253, with an average of a little over 42 per man. Cornell had 351, and George Washington University, 250.

Stokes and Denny, about this time, were inclined to kid Major Waller, as the Pennsylvanians got off on the wrong foot, including a five on one of the Navy targets, and left the 200-yard standing stage with a total of 238, in seventh place.

The 200-yard rapid-fire stage was fired under improving conditions. At this stage the Navy Gold Team turned in the top score of 275, George Washington University picking up the three points that separated them from the Navy Blue Team, with a score of 272 against the Blue Team's 269. Cornell, firing without coaching other than what the team members could give one another, kept well up, with 260. The slump on the part of Georgetown and Syracuse gave Major Waller's Pennsylvania proteges a chance to pull up into fifth place.

The weather had cleared by this time, although the wind maintained a steady pace of from fifteen to twenty miles. Operations were suspended while several large hampers of sandwiches, boiled eggs, and big containers of iced tea were dished up by mess-boys.

Conversation among the men making up the teams at this time was of the greatest interest to any one interested in the promotion of the rifle shooting game in the colleges. Cornell's experience may be taken as typical of a large number of institutions in this country. The Cornell riflemen are forced to shoot purely from their love of the sport, without any recognition from the student athletic council. The Cornell athletic council has assumed the attitude that *rifle shooting is not a sport*. Baseball, where only nine students play, and the rest sit in the stands, is a sport. Basket ball, with five men on the field and the rest packed around the cage, is a sport. Track, where only the cream of the students, physically, have a ghost of a chance, is a sport, but rifle shooting, which may be indulged in by any or all of the undergraduates, is not a sport!! This situation is not unusual, and is the general thing in the larger colleges. It is due to the gross ignorance on the part of the faculty and the students as to the real aspect of the rifle-shooting game.

Winning the school letter is the biggest thing in an undergraduate's life, and if the shooting game is to be put where it should be, in the colleges and universities, it must be placed on a plane where it will be possible for the rifle team to win the school letter in the same manner that the baseball, basketball, and other teams are awarded that distinction. Such an attitude is a direct reflection on that portion of the National Rifle Association represented by the men who have graduated from these universities and are now numbered among the institution's respected alumnus. No greater service can be done the game in this country at the present time than for every such man to take up with his Alma Mater the true aspect of the rifle-shooting game, and to throw his weight into the balance which will turn the scales toward a proper recognition of the college rifle teams. No precedent will have to be established in such a case.

The University of Pennsylvania awarded the full varsity "P" to the rifle team in that institution which won the Intercollegiate gallery championship in 1921-22. The Naval Academy awards the rifle team the "rNt." Yale does the same. A number of other institutions of similar standing award either the varsity letter or the minor sport letter. Certainly, Cornell and the hundreds of other universities and colleges throughout the country need not fear to follow where Pennsylvania, Annapolis, and Yale have broken the way.

To get back to the match, firing was resumed at 300 yards, rapid fire, prone from standing, immediately after lunch. The Navy Blue Team again turned in a top score of 272. The Navy Gold Team climbed close to the George Washington Team, with 264, but the Washington institution hung on to second place, with 258.

At 600 yards, Stokes and Major Waller had the first opportunity to really coach their crews. Three targets had been assigned to each team at all ranges, so that in the rapid-fire stages the men were too widely scattered for coaching, and had to go it alone, to a large extent. At 600 yards, however, it was possible to coach the men in pairs, and the result was immediately noticeable. The Navy Blue Team finished firing first, and turned in a total of 552. George Washington had to average a little over 94 per man, in order to overcome the fourteen point lead which the Navy had established at 300 yards, rapid fire. The first pair turned in 993, and the second pair 996. The crowd around the score board took on the aspects of the group around the big board at Perry in 1921, and again in 1922, when the Infantry and Marines were at the thousand-yard stage. George Washington's last pair, however, cracked under the strain, and the best that Stokes could get on the final count was 550. The match went to the Naval Academy Blues, with 1,346, as compared with George Washington's 1,330. In the meantime, on the extreme left of the firing line, Major Waller had been coaching the Pennsylvanians in real International Match style, ably assisted by Cooley, the University of Pennsylvania manager, Cooley handling one man and Major Waller two, of the three who were on the line at one time. The result of their combined efforts was a team total of 561, nine points over the best that the Navy first team could produce, and eleven points ahead of the George Washington Team. The handicap imposed at the shorter ranges was too great to be overcome, however, so that the Penn-

The Scores

Competitor	200 yards S. F.	200 yards R. F.	300 yards R. F.	600 yards S. F.	Total
Navy Blue	253	269	272	552	1346
George Washington	250	272	258	550	1330
Navy Gold	239	275	264	534	1312
University of Pennsylvania	238	244	255	561	1298
Cornell	251	260	251	534	1296
Syracuse	239	223	256	533	1289
Georgetown 1	243	237	251	507	1238
Georgetown 2	201	211	218	468	1108

sylvania aggregation had to be contented with pulling up from seventh place to fourth place in the final stage.

The work of the Syracuse and Cornell aggregations, coaching one another, deserves very great credit. The Cornell team turned in 534 at the 600-yard stage, which equalled the score of the Navy Gold, while Syracuse made 533. It is hard to account for the slump of the Georgetown team, unless the fact that this team has fired few, if any shoulder-to-shoulder matches, and consequently developed the "Buck" at Annapolis, may be considered as an important factor. To a casual witness, the team apparently suffered from over-coaching.

The Academy authorities deserve the appreciation of every American rifleman for the courtesies extended the visiting college teams. They not only supplied rooms for the three teams which went to Annapolis Friday night, but they furnished breakfast for them, and lunch for all the teams. Transportation was readily available, and the midshipmen themselves turned out for the target pit and scoring details. All arrangements seemed to have been well planned, and it is to be sincerely hoped that for the better education as to the true value of the rifle-shooting game as a training medium in colleges that the match next year will bring out teams from all the large institutions in the East.

Match ammunition of the vintage of 1922 was issued to all teams at the firing line. As a matter of fact, it is hard to think of any details that were overlooked. It is rather surprising that it should be the Naval Academy which takes the lead in this work rather than the Military Academy at West Point, where the curriculum of academic studies so much takes up the time of the prospective officers that they are unable to indulge in rifle practice, even to the extent of sending a team to the National Matches.

The importance of this match lay, not in the number of competitors or colleges represented, for that was admittedly small, but in the fact, first, that the Naval Academy is willing to furnish the facilities, and to even go a little further than they might reasonably be expected to go, in holding these intercollegiate rifle matches with the military rifle; and second, in the fact that there are men in the colleges enough interested in rifle shooting to follow the sport, even at the expense of forfeiting any chance of making the school letter. No cleaner or more enthusiastic group of riflemen could be found on any range than the undergraduates who fired the match at Annapolis, and in justice to them and the hundreds of other undergraduates who would take up the sport with a little encouragement, and in justice to the game as a whole, every rifleman who in any way exercises influence at any institution of learning, should bring it to bear in the direction of having the sport recognized as a minor or major sport by the Athletic Council of his Alma Mater.

It is to the colleges that the nation largely turns in time of stress for officer material. It is from the colleges that a goodly proportion of the influential citizens in civilian life come. The rifle shooting game needs the college man, and it is easy enough to get him if he is encouraged.

Gallery Qualifications, 1923

THE introduction of gallery qualification matches proved to be a popular addition to the gallery program. There were 97 entries at 50 ft. and 101 entries at 75 ft. The shooters at a shorter range qualified 26 men as expert, 18 as sharpshooter, and 10 as marksman, while those firing at 75 ft. qualified 18 as expert, 15 as sharpshooter, and 16 as marksman.

H. R. Palmer, of Sheridan, Wyo., led the 50 ft. competitors with an aggregate score of 741, using a Winchester Model 52 rifle, equipped with a 5A scope and Peters Tackhole Ammunition. J. C. Logsdon, of the same club, followed closely, with 738, using the same combination, while J. H. Ladd, also of Sheridan, finished third, just one point behind Logsdon. He also used the Winchester-Peters combination.

Larry Corsa, of New York, who recently established a new gallery record at 100 yds., headed the entrants at 75 ft., with an aggregate of 746, shooting a BSA, with US NRA ammunition and the Fecker scope. S. L. Touchton, of Chicago, and E. F. Burkins, of Wilmington, both turned in 736, Touchton ranking the Diamond Stater with a basis of a higher score rapid fire standing. Touchton used the Winchester 52, with the regular issue sights and Tackhole ammunition. Burkins shot the new .22 Springfield, with US NRA ammunition and a Winchester 5A scope. The score required qualified as expert by 715 out of a possible 751, sharpshooter 695, and marksman 675.

QUALIFICATION MATCH No. 28

	Total
H. R. Palmer, Sheridan, Wyoming	741
J. C. Logsdon, Sheridan, Wyoming	738
J. H. Ladd, Sheridan, Wyoming	737
A. L. Beale, Keyser, W. Va.	736
E. A. Davis, Sheridan, Wyoming	732
Ira L. Sorenson, Iowa City, Iowa	731
C. H. Mason, Bristol, Conn.	731
H. I. du Pont, Philadelphia, Pa.	730
B. T. Strickland, Massillon, Ohio	728
Chas. I. McNeil, Philadelphia, Pa.	728
Will G. Metz, Sheridan, Wyoming	726
G. J. Wiedmaier, Dunkirk, N. Y.	724
Richard Devereux, Brooklyn, N. Y.	723
G. H. Hickox, Iowa City, Iowa	723
Claude M. Stroup, Narberth, Pa.	722
R. M. Spengler, State College, Pa.	720
Lee L. Butterfield, Sheridan, Wyoming	720
Capt. Thos. E. Martin, Iowa City, Iowa	720
Walter J. Dehner, Iowa City, Iowa	719
Fred McGee, Midwest, Wyoming	718
Clyde O. Miller, Sheridan, Wyoming	718
C. H. Parker, Midnot, North Dakota	716
Richard W. Ballard, Iowa City, Iowa	716
Harry E. Brill, Tulsa, Oklahoma	716
Frank R. Ulmer, Bayonne, N. J.	715
J. E. Faust, Massillon, Ohio	715
E. R. Kinnaird, Iowa City, Iowa	713
G. F. Kuist, Minot, North Dakota	710
L. G. Wilhelm, Minot, North Dakota	709
L. E. Klien, Massillon, Ohio	709
W. H. Burt, Thermopolis, Wyoming	708
R. M. Pray, Iowa City, Iowa	708
H. C. Williams, Pasadena, Calif.	708
E. B. Leefboro, Janesville, Wisconsin	707
C. M. Feil, Massillon, Ohio	704
Dr. M. E. McManes, Piqua, Ohio	704
Capt. M. F. Shepherd, Ft. Crook, Nebr.	704
P. A. Wiedmaier, Dunkirk, N. Y.	702
F. W. Foote, Albion, Indiana	702
H. G. Dollman, Indianapolis, Indiana	698
B. C. Balernd, Minot, North Dakota	696
Wm. Kimball, Minot, North Dakota	696
C. R. Thorn, Sheridan, Wyoming	696
J. W. Spencer, Sheridan, Wyoming	695
Dr. C. J. Moore, Bristol, Conn.	675
W. L. Bruce, Cheyenne, Wyoming	694
Albert Nott, Janesville, Wisconsin	693
C. J. Froid, Minot, North Dakota	689
R. J. Hart, Janesville, Wisconsin	684
Elmer F. Moore, Tulsa, Oklahoma	683
Thos. F. Meagher, Tulsa, Oklahoma	682
Jean Merz, St. Louis, Missouri	682
L. D. Vaughn, Thermopolis, Wyoming	678
Keith Willard, Evanston, Illinois	677
D. P. Lambert, Minot, North Dakota	675

QUALIFICATION MATCH No. 29

	Total
L. J. Corsa, Woodhaven, N. Y.	746
S. L. Touchton, Chicago, Illinois	736
E. F. Burkins, Wilmington, Delaware	736
F. E. Border, West Bend, Iowa	734
A. J. Huebner, Chicago, Illinois	730
Ed. Montag, West Bend, Iowa	729
H. J. Wood, Bridgeport, Conn.	728
O. H. Maberry, West Bend, Iowa	727
W. W. Stone, West Bend, Iowa	725
George Gawehn, Ft. Wayne, Indiana	724
Major J. K. Boles, Ames, Iowa	724
E. S. Shoemaker, Harlowton, Montana	722
John Dorweiler, West Bend, Iowa	719
E. G. Moulton, Worcester, Mass.	718
J. F. Houck, Fort Wayne, Indiana	718
C. W. Wahrer, Sacramento, California	717
A. K. Friedrich, Ames, Iowa	717
C. E. Stodter, Washington, D. C.	715
F. C. Payne, Los Angeles, California	711
C. H. Wuchter, Huron, Ohio	710
H. S. Willard, Ridgewood, N. J.	708
H. J. Morrell, New Haven, Conn.	703
W. G. Hansen, Sacramento, California	702
C. R. Williams, San Francisco, California	701
Capt. A. R. Smith, Toledo, Ohio	700
F. D. Preston, Ft. Wayne, Indiana	700
R. V. Newcomb, Ames, Iowa	699
J. O. Norcross, Worcester, Mass.	699
A. J. Davidson, Chicago, Illinois	699
L. A. Carlson, Jamestown, N. Y.	698
R. B. Richardson, Ellwood City, Pa.	697
J. R. Satava, Cleveland, Ohio	697
Agnes Willoughby, Balboa Heights, C. Z.	697
A. E. Smith, Sacramento, California	692
Norman Herman, Coatesville, Pa.	692
H. D. Schutt, Schenectady, N. Y.	691
E. A. Lycke, Sacramento, California	689
G. D. Cutting, Worcester, Mass.	689
F. G. Delbon, Brooklyn, New York	688
E. C. Campbell, Lewiston, Montana	687
W. M. Hire, Castalia, Ohio	686
Geo. A. Halloran, Balboa Heights, C. Z.	684
Max R. Boggs, Cristobal, C. Z.	683
A. B. Sprague, Worcester, Mass.	681

RUSSIAN RIFLES

RUSSIAN rifles have been reduced to $3.34 each, including packing, and the ammunition has been reduced to $4 per thousand in case lots.

These rifles are on hand at Benicia, Cal., Arsenal; Rock Island Arsenal, and Raritan Arsenal, Metuchen, N. J., and the ammunition is on hand only at Benicia Arsenal.

A Law for the Outlaw

(Concluded from page 3)

Dealer—"Well, it is a joke. It is a damned serious joke and the joke isn't only on you, but on all honest, law-abiding citizens. You are right that the Constitution gives us the right to bear arms. That is true, but the men who pushed and backed this law have little or no regard for the Constitution. The main backing of such a measure has been, and will be in the future, the radical Reds, the disciples of Soviet Russia. The men and women who drink toasts to the day when the United States, as such, will be no more. These people would burn the Constitution, would sack the Capitol, have murdered our Presidents, have bombed the people, and today are chuckling over the way they have partially, at least, disarmed the people. You may well get excited, young fellow. It is high time that you did. It is not too late, but unless you and all others like you do wake up and make yourselves felt you may mark my word that you will live to see the day when you won't be able to even own an air gun."

Customer—"And to think that the police, the men who we expect and look to to maintain order, helped put such a law across. My gosh! it looks to me as though they had thrown up the sponge and admit that they can't enforce the law. A pretty mess, I'll say, and today, in the paper, I noticed an item that said that holdups and murders had about doubled in the past few months. Say, what's the world coming to anyway? But this law gets my goat, it makes me mad. Why, the poor nuts, who do they think we are, anyway."

Dealer—"Well, my boy, those poor nuts you mention just have taken you for the poor boob that you are. Maybe this will wake you up, but if you had taken in earnest what you read six months ago about this very anti-pistol bill, and had gotten busy, it is not impossible to think that it would now not be a law. Blame no one but yourself. I did all I could, but as I said before, the anti-pistol bunch had lots of money and were organized. They wanted a law for the Outlaw, and thanks to fellows like you who wouldn't wake up, they have it. The price of this $8 pistol is now $108, and cartridges to use in it will cost you $50.35 per box. I must go and make out my daily report, so unless you want the gun I will bid you good-day."

Customer, very much subdued—"No, I can't buy any gun at such a price. It is an outrage. By the way, tell me, who do you have to make out a report to? I thought you owned this store."

Dealer—"Oh, I do; but you see under another law I am compelled to report the name of every man who calls in here and who owns guns of any description. You see, my boy, it is not a joke, it is a very serious matter. As a patriotic citizen it is something for you to think over."

Customer, turning for the door—"I'll say its serious. I wish now that I had read that stuff, but I didn't. Goodbye, and say, when you write my name on your list, underscore it and tell them that I don't only own guns, but know how to use them."

Dealer, as he turns and walks slowly to back of store—"Brave boy, and with his heart in the right place, but he is just like a lot more of them who never pay any attention to anything but having a good time and making money. His nerve and heart will not be worth much to him should all his guns be taken from him, and could the Radicals have their way it would be done. I hope to heavens for the sake of the country, that others like him will wake up and not alone check such moves, but throw the leaders out of the country."

A Palma Match for 1923

(Concluded from page 2)

though it is true that modern armor-piercing shells are covered with a hollow sharp point called a ballistic cap, and offering something of a parallel. The big shell, however, does not offer any such opportunity for deflection by quartering wind, because its ballistic coefficient is so great that it cannot be compared in this respect to a small-arms bullet.

So thus ended the last Palma match. England has not entered one of them in fifteen or twenty years. Until 1913 the argument has been between only ourselves and our northern boundary friends. The Palma Trophy, which makes the well-known horse of John Astor look practically nude in its dingle-dangles and its pretties and its medallions and things, rests in the halls of the War Department with that other international symbol, the Dewar Trophy.

Isn't it about time we dusted it off and took out and hung it up in a prominent place facing north, and called the attention of our great English-speaking neighbors to the little matter of what it represents?

Four Foreign Bargains

(Concluded from page 5)

say whether it is accurate or not, for the 'scope plays strange tricks. At first sight this glass strikes one very favorably—it is neat, well finished, and gives a beautifully clear field and image, when on its good behavior.

Something is wrong inside, however, for sometimes the focus is obtained at one adjustment and sometimes at another, and again it can not be obtained at all. It appears to change, for instance, when heated by the sun, although all of us who have examined it can testify that it actually needs no distinctly stated excuse for changing. The lenses are loose, or the outside tube warps, or the mountings of the lenses throw curious strains on the lenses, producing distortions. Billy has had the glass apart without improving it any, and he swears he will not spend more good money sending it to a repairman.

The other telescope appeared to be a success for a few days, giving beautiful images and giving them reliably. It had a larger field than the first. After the gun was fired about thirty-five times, however, one of those so-clear lenses cracked in several pieces, and now the glass is useless. Perhaps the owner can get the 'scope repaired, but if so, how much will the repair cost, and will the glass be reliable and clear when it is repaired.

This rifle developed troubles of its own in the trigger mechanism. It would not always stay cocked. Its pull, although usually most desirably short and smooth, once in a while amounted to just a touch, and one never knew when to look for the latter. Examination showed that the upper bearing point of the sear was cracked off at a slant, leaving only a point extending to the original height, and this was wearing round.

Texas To Hold Big Shoot

THE third annual rifle competition of the Texas State Rifle Association will be held on the Camp Mabry range, Austin, June 18, 19, 20, and 21.

The range is of echelon construction, having 12 targets each at 200, 300, 500, and 600 yards. The 1,000-yard range has 12 targets. The range has been gone over and is in first-class condition and ready for firing. Camp Mabry is located about three miles northeast of Austin, and is an ideal place to hold our matches.

Over 25 new civilian rifle clubs have recently been organized in Texas, making a total of over 40 clubs actually functioning at this time. There are over 50 more clubs now in process of organization. The Texas State Rifle Association is more than pleased at the rapid progress being made in rifle practice and we are assured of the largest attendance and best matches ever held in the South.

The program has been arranged to suit the "whims" of all. There is a match to suit you. More trophies this year than ever before. Over half a dozen permanent trophies someone is going to carry home, and they will be useful, too.

Arrangements have been made with the Adjutant General's Department to furnish sleeping quarters in the National Guard Barracks. Competitors will be issued cots and plenty of blankets without cost; however, they should bring pillows and linen with them. A mess will be established for the convenience of the competitors at a very nominal charge.

Full particulars of the shoot may be obtained from the State Association Secretary, Charles M. Crawford, Adjutant General's Department, Austin, Texas.

The program for the matches which has already been announced, includes 24 individual and team events for the rifle and pistol.

Insure the Life of Your Rifle, Revolver or Shotgun

Remington Rem Oil.

A lubricating, cleaning and polishing oil for use in the home, office, store, garage or on the farm. Use Rem Oil when you need a good lubricant. *Rem Oil is all oil. Positively will not gum or stick.* Absolutely clear, free from acids, prevents rust. Furnished only in handy cans, with non-refillable tops.

Remington Rust Remover.

Removes rust from metal surfaces of all kinds. Fine for Tools, Skates, Golf Clubs, Bicycles, Gun and Rifle Barrels, etc. Furnished only in tubes.

That is what it means to use Remington Rem Oil, Powder Solvent, Gun Grease or Rust Remover, on your favorite firearms.

From the use of these products on your favorite guns you will greatly prolong their life and incidentally benefit personally thereby from the thrill of genuine pleasure which comes from the use of firearms in the pink of condition.

Any Sporting goods or Hardware dealer can furnish any one or all of these Remington preparations, which have long since passed the experimental stage.

Follow the directions plainly printed on each can or tube and your rifle, revolver or shotgun will be better for it.

Here's a new one: If you wish to remove rust from anything apply a little of the powder solvent. Let it soak in for a few minutes, then apply the rust remover.

These four cleaning and preserving preparations have a thousand and one uses and for firearms they are superior.

Go after your dealer today.

Remington Arms Co.

INCORPORATED

ESTABLISHED 1816

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Remington Powder Solvent.

A superior product for cleaning and removing powder residue from Rifles, Shotguns and Revolvers. Will neutralize any acid action that may be set up by the powder residue, prevents rust and corrosion. Furnished only in handy cans with non-refillable tops.

Remington Gun Grease.

Protects metal surfaces from rust and corrosion. Unaffected by climatic conditions. Made from pure materials. Adapted for Cutlery, Sewing Machines, Tools, Skates, Bicycles, Typewriters, Firearms, fine instruments and machinery. Furnished only in tubes.

THE AUTHORITY IN FIREARMS, AMMUNITION AND CUTLERY

Lubaloy Bullets

No more brass brushes, ammonia or other "dope" and no more fouled or pitted barrels. Lubaloy bullet jacket metal not only prevents metal fouling but it actually cleans barrels that have been fouled by cupro-nickel or other non-lubricating bullets.

By eliminating the tenacious little drops of metal near the muzzle end of the bore, Lubaloy makes the thousandth shot as accurate as the first and gives longer life to the piece by preventing a harbor for the ruinous potassium chlorate deposits which have pitted so many barrels. These advantages have been recognized by the leading ballisticians of the world, including those of the United States Government.

Lubaloy jackets, besides being nearly twice the thickness of ordinary copper or cupro-nickel jackets, are very hard and tough without being brittle. These qualities are your insurance against slugging in the bore and make this alloy ideal for bullets of the open point expanding type.

Lubaloy bullets are now obtainable in the principal rifle and revolver cartridges and will soon be supplied in all Western jacketed bullets.

WRITE FOR FREE BOOKLETS.

The Lubaloy non-fouling bullet, the Boat-tail bullet, the Open-point Expanding bullet, and the Marksman .22 long rifle cartridge have all contributed to greater rifle accuracy. A card will bring you details concerning any of them.

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A free service to target, big game and field shots, all questions being answered directly by mail.

Rifles and big game hunting: Maj. Townsend Whelen.

Pistols and Revolvers: Maj. J. S. Hatcher.

Shotguns and Field Shooting: Capt. Charles Askins.

Every care is used in collecting data for questions submitted, but no responsibility is assumed for any accidents which may occur.

A FREAK GUN

SINCE everybody else seems to impose upon you, I am going to do my part in the same line.

I want to build myself a freak gun. I have a new barrel for a Remington 20-gauge pump shotgun, also a new barrel for the old Sharps 40-90 B. N. I had contemplated getting hold of a Sharps Borchardt action that was in good order for the Sharps barrel, and I wanted you to tell me whether or not there is throat enough in these old actions to handle a 20-gauge shot shell which is just three-fourths of an inch over the rim, also did the Sharps Borchardt have a kicking extractor? I remember these fine old rifles (in their day) were made in large calibers, but it has been years since I saw one and know now where there is one for sale cheap, but its too far away for me to see, hence I am asking you for this information.

I am workman enough myself to turn down the shotgun barrel to fit the action or bush it as the case might be, I would just like to have one Sharps for a sort of relic but never was much on keeping a gun that was not serviceable. I have a supply of Winchester make of cartridges which I could reload. In case there is not throat enough in a Sharps Borchardt action for a 20-gauge shell, what other single shot action would you suggest my trying for a nifty odd action for my Remington 20-gauge barrel.

I. H., Goldendale, Wash.

Answer (by Major Whelen): Unfortunately, I have no Sharps rifle here, and no one that I know of in town to try the 20-gauge shell in. But I think you can get it in all right. At the worst you might have to grind away a little inside the receiver just back of the breech bolt. The Sharps hammerless extractor is not a kicking extractor. You may run into difficulty in fitting the barrel to the barrel thread on the receiver. Better get the receiver on approval if you can.

You know the Winchester Company took a lot of their Winchester single-shot actions and fitted them with 20-gauge barrels. These guns are no longer advertised, but I think they still have a few on hand.

THREE-BARREL GUNS

I WOULD like to have your opinion on the following: Are the three-barrel guns (2 shot, 1 rifle) desirable arms for hunting? Are the rifle barrels as accurate as single barrels, when one of the shot barrels has become heated? Please give address of firm making the best of above arms.

I have a friend who necks down the 32-20 Winchester shell to a 22 caliber bottle neck; uses a 50-grain copper-jacket hand-made bullet with accuracy equal to or better than the .22 long rifle; with very flat trajectory uses Winchester single-shot action, heavy barrel.

I would like to have a rifle as described, but would like to avoid necking down the shell. Or is this not a very difficult job? (Friend in a distant State.) Would the following method work: By chambering barrel so bullet could be seated from breech; then have 32-20 shells loaded with required number of grains, and a perforated celluloid wad to hold powder in shell—perforated to prevent air compression in barrel. Would this perforated wad be necessary?

I have tried seating bullets in a 32-40, then cut the shell down to about an inch and a quarter loaded with 12 grains of Schutzen powder, but the shells always collapsed—is the proper word. They buckled up as if the air had been exhausted from them.

Could the Model 1892 Winchester carbine be made to handle the most powerful Winchester automatic cartridge? 401 I believe is the caliber. Is the action strong enough? I like these little guns and the Winchester single-shot action above all things.

Is the Winchester single-shot action well adapted to handle the Springfield cartridge with 180-grain bullet, and are tapered breech blocks preferable?

Where is the Niedner Co. located? Also is the Neidner special firing pin preferable in high-power single-shot rifles. J. C. B., Dixon, Cal.

Answer (by Major Whelen): In the past, the Germans made some very excellent 3-barrel guns, that is, a double-barrel shot gun with a rifle barrel underneath. These were very handy weapons for country where one was liable to come across both small and large game. The shot barrels shoot as well as those on any shotgun. The rifle barrel shoots plenty good enough for work up to 150 yards, but its accuracy can in no way be compared with a heavy single-barrel rifle, as the light rifle barrel soldered its whole length to the shot gun barrels doesn't heat up evenly, and its previbration is interfered with. On the whole, the weapon is most excellent for hunting, but I wouldn't advise the rifle portion of it for target shooting.

I do not know of any firms whom I can recommend. Every month a few of these weapons, in good condition, find their way on up to the New York market, and you can probably purchase one by writing to any of the big sporting goods firms in New York. They are now bringing quite high prices—from $200 up.

Your methods relative to using small-caliber bullets in a barrel chambered for the large-caliber shell are hardly practicable, and I doubt if you can get very good accuracy. Let me suggest that the Niedner Rifle Corporation, Dowagiac, Michigan, are now making a .22 rifle, high power rifle barrel shooting the .32-20 cartridge neck down to .22 caliber, and a 65-grain copper-jacketed bullet. They get excellent accuracy. They can fit a barrel for this cartridge to a Winchester single-shot action; they can also supply cartridge cases neck down, and bullets and reloading tools.

The Winchester, Model 1892 carbine, cannot be made to handle the 401 automatic cartridges. The cartridge is very much too large, and also has a rimless case.

If you can obtain a Winchester single-shot rifle for the .30 caliber Krag, it is possible to have it remodeled and rechambered for the Springfield cartridge. The Winchester single-shot rifle, in which you intend to shoot high-power cartridges should have the Niedner special firing pin fitted to it.

HOW TO USE THE DOPE BAG

Address the Director of Civilian Marksmanship, and not the Dope Bag on Arms and Ammunition available for sale and prices on same.

Mark your letters at the head for the proper man, and deal only with one subject, i. e., rifles or pistols or shotguns in one letter. It is impracticable to refer letters around.

Write legibly on one side of paper only and sign name and address legibly. Almost every mail contains letters that cannot be deciphered and hence cannot be answered.

Before writing consult the various catalogues and ballistic tables published by manufacturers. Much information can be obtained from them as well as from standard books and publications of the N. R. A.

A BROKEN KRAG BOLT

ON a hunting trip last fall my friend had the bolt of his Krag to break. The front locking lug split. We were using regular full-charge Western 180-grain open-point cartridges. We kept on shooting with the bolt in this condition and have shot some since, the crack does not seem to get any worse. Are we in any danger by using this bolt? I would say the split is about 1-32 of an inch wide and about one-fourth inch long.

N. M., Coatesville, Pa.

Answer (by Major Whelen): You have given me the very first case I have heard of where a Krag bolt lug has cracked where ammunition with normal pressures was used. I think it is a case of either defective steel or defective hardening. Such a thing is likely to happen in making half a million bolts, but it speaks wonders for the Krag and for Springfield workmanship that it happens so seldom.

I would strongly advise against using this bolt. If it is defective the lug may crack off at any time. You ought to write to the Director of Civilian Marksmanship about it, send him the old bolt. I think that if the bolt is defective it can be replaced without charge. Anyhow a new bolt will cost very little. A new bolt will interchange and fit perfectly. Send the bolt only, and not any of the mechanism.

HEAVY BARREL ACCURACY

I AM writing you for some information regarding the accuracy of the new pressure barrel Springfield, as compared with the accuracy of the star-gauged and specially selected National Match rifle. I have the latter and prize it very highly for its accuracy, and I know what it is capable of doing at all ranges, but I know nothing about the new pressure barrel, only what I have read, and if it is all that it is claimed to be I certainly would like, and intend to have, one. You will greatly oblige me by giving your personal knowledge and experience of this new gun. L. G. P., Denver, Colo.

Answer (by Major Whelen): A comparison in accuracy between a regular Springfield, star-gauged and specially selected for the National Matches, and a Springfield fitted with heavy special Match barrel is best indicated by the following average diameter of groups fired from each with the very best ammunition:

Range	National Match Rifle	Heavy Barrel Rifle
200 yards	4½ inches	2¾ inches
600 yards	15 inches	8 inches
1,000 yards	28 inches	19 inches

A NEW LOAD

AS YOU know, cranks never tire of speculating about new loads, and I have for a long time been mulling over the following proposition: Get hold of an extra light weight .45-70 Model '86 or a .50-100-450, with solid frame and half magazine and Hart-Andrews on the job to fit a 24-inch rather heavy tapered barrel chambered for the .50-100-450 (or .50-110, which is the same shell, I think) necked down to .38 and using the .38 soft-point bullet of the old .37-72 of 270 grains (!) with enough No. 16 or No. 17½ to keep the pressure at about 40,000 pounds, which might give a velocity of about 2,300 or possibly a little more, and, on account of the excess capacity of the shell, the charge would probably not occupy all the space and would thus tend to keep the pressure low. This would make a good bone smasher, and the same cartridge could be loaded to between 1,700 and 2,000 for deer and light stuff. The chambering and throating, of course, on modern lines for maximum accuracy.

Remington thinks I can't get enough velocity with their 60-gr. mushroom bullet in the R. F. shell; but I have asked for some and will try them out with both No. 93 and Schuetzen and find out.

When the weather opens a bit I hope to take a pleasant spring day off and fire a couple of hundred of the Erie bullets for accuracy tests and see whether they will give consistent results for a long

series of shots. Are you ready for me to send you a batch for trial yet? To date, Peters has got the best results with these bullets.

M. D. M., Akron, Ohio.

Answer (by Major Whelen): Regarding your .50-110 case necked down to use the .38 caliber 170 grain bullet, have you considered the following: These .38 caliber bullets are very hard to get and are getting scarcer every year. To get chamber reamers made which will chamber accurately enough to give you groups of less than 10 inches at 200 yards, will certainly cost you $250, and there is no one else to share the expense of these reamers as you will probably be the only one using this cartridge. In addition, reamers have to be made and then dies have to be made for necking down the case. This will also cost about $250. This right at the jump off I do not think you can afford it.

HUNTING IN BRITISH COLUMBIA

WILL you please give me some information on the hunting possibilities of northern British Columbia, Canada? What game is there? When is the season open? Must you go far from salt water (the inside passage)? Is it absolutely necessary to have a guide? I have had a good deal of experience in hunting in the United States and prefer to go with just one or three men. Can you tell me about the cost of a three-weeks' trip, including license? I shall take a Springfield rifle. What ammunition would you recommend? Can heavier than 150-grain bullets be used in the .300 Savage? What would be the most powerful load possible to use in this gun?

Thanking you in advance, I remain,

H. B. M., Tacoma, Wash.

Answer (by Major Whelen): Relative to hunting in British Columbia, on the seacoast at the heads of the big inlets you will find deer and high up on the ranges there are a few mountain goats. The climate is wet and rainy. I would not specially advise a hunt on the coast.

Southern British Columbia in the interior is pretty well shot out.

Northeast of Backerville, reached by auto-stage from Ashcroft, on the Canadian Pacific Railroad, you can get good moose, caribou, and goat shooting.

North of this there is little but moose until you get north of the valley of the Skeena River into the country drained by the Stikeen River. There you get into a game paradise with bear, moose, caribou, sheep, and goat.

It is quite possible for an experienced hunter, one familiar with finding his way through unknown country, experienced in handling a pack train, to hunt without a guide. But in British Columbia it will take you at least ten days to get into good game country from the railroad, and I do not believe that an outside hunter can possibly expect success on less than a two months' trip. Such a trip without guides would cost two men from $300 to $400 apiece, depending much on the price of horses.

If you are really thinking seriously of this trip, if you have the two months' time available, and the necessary cash, and if you can convince me that you have the requisite physique and the necessary experience in woodcraft, mountain craft, knowledge of packing and horses, ability to cook, chop, find your way, shoot, dress game, etc., I shall be glad to give you full information which will enable you to make a successful trip without a guide.

The usual charges of a guide in this country are $25 a day for each sportsman.

For the Springfield I would recommend any of the ammunition made by our leading companies using the 180-grain, pointed, expanding bullet. The .300 Savage rifle cannot be used successfully with a bullet heavier than 150 grains. No heavier charge can be recommended. It is a very satisfactory rifle with the regular Savage factory ammunition.

A PRESSURE GUN FOR THE 25-20

I WISH to consult you regarding a pressure gun for the 25-20 cartridge. In explanation will say that I have worked a long time to produce an accurate high-velocity load for this gun but have been handicapped for lack of suitable powder.

The Du Pont people have kindly forwarded samples of their new powders Nos. 25, 50, and 93, and have asked me to experiment with them, as they have been too busy to carry on any late tests with this caliber. Inasmuch as these are all fast-burning powders, and as they have no loading data whatever, I must check my work carefully in order to remain within certain limits of pressure.

I think I am posted as to the general theory of a pressure gun. A hole is bored through the barrel into the chamber, and polished smooth and of correct size to allow a sliding fit of the copper. After inserting shell in chamber, a couple of brass washers followed by the copper-crusher and more washers is inserted into hole. I should imagine it might be necessary to use a hardened pin to fill any deficiency in filling the hole. My idea was to then have a heavy steel collar to slide up the barrel and lock the hole during firing. After taking pressure, the copper is measured with a micrometer and pressure taken from a prepared table. Have I the right idea?

If you would supply any details that I seem to lack, it would help greatly, and I must appeal to you for information as to how and where I can get a copy of the table as used at Frankford Arsenal, and coppers of the same type. I prefer to use the uncompressed copper if possible to get it.

J. F. W., Wausaw, Wis.

Answer (by Major Whelen): It is entirely possible to have a pressure gun made. It is also possible for an inventor or investigator like yourself to obtain copper pressure cylinders and tarrage table from Frankford Arsenal. The cost of these coppers is small, but the cost of a pressure gun is very high. It will require a skilled toolmaker to make one. Extreme accuracy is necessary, and it is really beyond the skill of an ordinary machinist. Such a man will charge about $2 per hour, and on the first job of this kind will probably take about 150 hours. I could have a draftsman copy the standard drawing, could also write you specifications and directions for use which would take about 15 pages of typewriting. All this can be done if you desire it and are willing to pay for it. I do not charge for my own work, of course, but I may not be able to complete the drawings and specifications for about a month after you request them.

But I do not believe a pressure gun is necessary for your work. It is difficult to get too high a pressure in the .25-20 cartridge provided you do not use pistol powders, and do not compress your powder. If pressures are a little too high for a regular load they will show in pierced primers, leaky primers, or in blown out primers before they get to the really dangerous stage. I think you are perfectly safe in going ahead without a pressure gun. When you develop a load you think is entirely safe, non-corrosive, and accurate you can send it to du Pont or Remington and ask to have the pressure and velocity taken. They are always ready to do this for a really scientific investigator who knows what he is doing, although of course they cannot do it for everyone, because I imagine that a series of ten pressures and velocities will cost a company about $50.00 in labor alone, and as they usually make no charge you can see what they are up against.

I sincerely hope you will carry these experiments through. The cartridge and rifle are most excellent ones for settled community shooting—all except the corrosive bugbear. To conduct the experiment right will be expensive. One should have a takedown rifle with a number of nickel steel barrels so he can assign one barrel to each kind of powder. No load should be considered good unless it gives fine accuracy, and after 1,000 rounds shows no sign of corrosion in the bore. I am convinced that ordinary steel barrels will not give the desired results on account of both corrosion and wear. I should like very much to know the results of your experiments.

A LOAD FOR THE .45-70

I HAVE a Springfield rifle U. S. .45-70 with 36-inch barrel, and I want a load for this gun that will be accurate at 300 to 350 yards. I do not care for the high-power long range guns, as I do not want my shoulder dislocated either. Please tell me what would be a comfortable load for this wonderful gun. Would you reduce the weight of the bullet or just the powder charge, and would you use the 405 or the 500-grain bullets. What powder must I use and how much? I do not want a powder that will injure the barrel.

T. P. M., Washington, D. C.

Answer (by Major Whelen): For your .45-70 I can really recommend nothing better than 70 grains of du Pont F. G. Black Powder, or 70 grains *bulk* of King's Semi-Smokeless C. G. Powder, and the regular .405-grain bullet. The bullet should be cast of one part of tin to 16 or 20 parts of lead, and it should be sized to .457-inch and lubricated in an Ideal or Bond lubricating and sizing machine. Load the bullet projecting a little further out of the case than ordinarily. A good deal depends upon your skill in moulding bullets. I regard the lubricating machine as absolutely essential to good bullets. Do not expect the best of accuracy for more than ten shots without cleaning. Having a rubber tube inserted in an empty cartridge case, and putting the case in the chamber and breathing through the barrel slowly between shots tends to keep the fouling moist and gives better accuracy. You should get good accuracy with this load up to 500 yards.

Perhaps you wonder why I recommend black powder. I really do not know of a decent smokeless powder or smokeless powder load for use in the Springfield. There are, however, quite a few smokeless powder loads that do very good work up to 150 yards in a Winchester Model 86 rifle with nickel steel barrel, but the Springfield is quite different from such a rifle.

THE SMOKY RIVER COUNTRY

I USED to correspond with you some years ago, about say twenty, when you were in the Philippine Islands and I used to live at Marshall, Mich. I have always been a gun and pistol crank. I used to herd cattle in Wyoming in 1889. My headquarters were at Rawlings, Wyoming, and I carried two Colt's .44 and then I had one Bisley Model .45 and I still have it. In those days there were lots of Indians there.

I take THE AMERICAN RIFLEMAN and I saw your article in regard to the Peace River Country. Now, I am a great hunter and trapper and I want to have another good hunt and get to some place where I can make some money trapping. I have had some bad luck—lost my wife and then I sold my farm, went to Alaska three times, have been prospecting and lost a lot of money and I would like to make some more now. Will you tell me all about that country and where to go, how to get into the Smoky River, where to get off, and where is the best place to ford the Smoky River? Don't you think it would be a good idea to take a canvas boat with me? Where will I get the pack horses? What will it cost me to get in there? I would thank you to give me full details about the lay of the country by letter.

M. N. R., Carbonado, Wash.

Answer (by Major Whelen): I am very glad to have heard from you again. I am glad to give a man of your type information of this kind. You want a locality where you can get first class hunting and trapping, and where all the trapping grounds are not taken up.

Take a good, light outfit and go to Edmonton, Alberta. Get your stock saddle, pack saddle, and all equipment, except grub, there. Then take the train to Grand Prairie, Alberta. There you can get a pack horse and a saddle horse for from $50 to $70 apiece, also your grub. Hire an Indian for a few days to show you the way to the Porcupine River and the trail that goes part way up the Porcupine. Go up the Porcupine to its head. You will find a good location up there. You can winter your horses down on the west bank of the Smoky River around Grand Cache or around Grand Prairie. Get a good map of northern Alberta and you will understand. The mountains start about 40 miles west of Grand Prairie. Twenty miles into them you get into new country. No one has been in there. There are no trappers. The trapping is good and the hunting is fine. Up around the headwaters of the Porcupine there are lots of moose, caribou, sheep, goats, and grizzlies. I went in from Entrance, Alberta, but that is a long, hard way. I am sure you can do it all right, but I would surely take the Indian for a few days to start you right. Understand, the country a hundred miles to the west of Grand Prairie around the headwaters of the Porcupine and Wapiti Rivers, up near the main divide of the Rockies is unexplored and unknown. Even the Indians don't know the way in there. They only know the country part way up the Porcupine. There is a trail part way up the Porcupine. After that you have to find your own way. Its a good country, good horse feed everywhere, and plenty of big game, grouse, and trout. Fur is mostly martin, ermine, wolverine, and lynx. Next year will be the big rabbit year, so it is the best time to go. Go in June, locate your country, pack in supplies in the late summer and early fall, bring your horses out to winter, and backpack it into your cabin.

THE MERWIN HULBERT

PLEASE tell me where and what cartridge to order for this pistol: Hopkins & Allen, formerly Merwin Hulbert, 6-gun, 44 caliber. But all the 44's seem too large and will not fit; have tried all of the late makes of 44's that I can find in Los Angeles but so far no results. The gun resembles S. & W. but does not break or swing out the cylinder but by turning the barrel to one side both the barrel and cylinder move away from the handle on a center pin. I received the two pamphlets from the N. R. A. and thank you for them.

A. P., Ontario, Calif.

Answer (by Major Hatcher): The Merwin Hulbert revolver was made for several cartridges, including the .44-40, so I have no doubt that this is the cartridge you want. Be sure to use the low power cartridges and not the "High Velocity" type, as these high pressure cartridges are intended for use in rifles only, and are dangerous in revolvers.

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Thanking you again for the excellent job you did for me and assuring you that I will call on you again if I need any more work of this character done, I am

Yours, very truly,

O. F. MAXON.

A GUN FOR MOOSE

WILL you give me, if you please, your idea of the best moose gun? I have a Mannlicher-Schoenauer 9.5 mm. and it's very accurate, but I can't enthuse over it and the strangest fact is that I don't know why, unless its my lack of confidence in foreign ammunition. I have a number of rifles for other game and so am riveting my attention on a *moose* gun. Will you tell me which of the four enumerated below you would consider the *best* for game at not more than 200 yards?

1. Winchester 405.
2. Winchester 45-70.
3. Mannlicher-Schoenauer 9.5 mm.
4. Springfield National Match, shooting 170 gr. (velocity 2,700 feet).

I have your book on the American rifle and it's more or less of a rifle Bible to me. You do not seem to be especially enthusiastic for the 45-70 (model 1886) and yet I have a great big hunch that I'd like it. What do you think? J. L. D., Albany, N. Y.

Answer (by Major Whelen): The 9.5 mm. Mannlicher Schoenauer should be an excellent moose gun if you could get really good ammunition for it, which I think is very difficult at the present time.

The other rifles you mention are all excellent for moose. The .45-70 is as good as any except that you have to begin to allow for distance beyond 150 yards. In the Springfield I would prefer one of the various cartridges loaded with 180-grain expanding bullet at 2,700 f. s. velocity.

After having hunted, studied, and shot moose for over 10 years I have come to the conclusion that bullet shock has little effect on them. During the entire hunting season bull moose are constantly fighting with each other. They inflict terrible wounds, to which they pay very little attention. They come together with terrific impact, and often the noise of their horns is fully as loud as a rifle report is at 50 yards. A moose feels no more shock when struck with a rifle bullet than he does when in a fight with another bull. Indeed, if he has not seen or winded the hunter he usually thinks that another bull has struck him, and he does not seem to get alarmed and run, as an elk or deer would. This fact often makes the tyro hunter think that his bullets are having no effect, and even if he does kill he is likely thereafter to distrust his weapon. Experience on moose is a great factor in causing a tyro to change from one rifle to another.

I believe the best moose gun is the one which destroys the greatest amount of vital tissue, provided, of course, that the bullet is heavy enough to get into the vital parts. All rifles with velocities less than about 2,300 f. s., and having good expanding bullets, wreck the tissues within two to four inches of their track through the animal. But a heavy bullet at 2,700 f. s., or above, when it gets into the chest or abdominal cavity has what we term an explosive effect. Often the entire cavity is pulped or badly lacerated. Such wounds prove fatal very quickly. For this reason I am rather inclined to favor the .30 caliber with 180-grain expanding bullet at 2,700 f. s. or over as the best moose cartridge.

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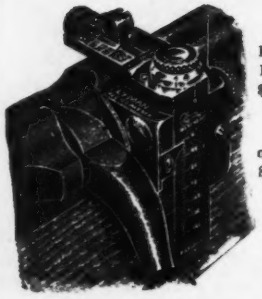

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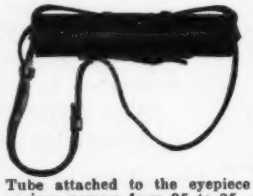

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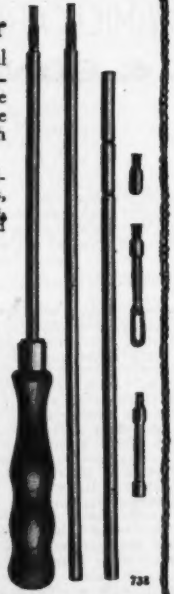

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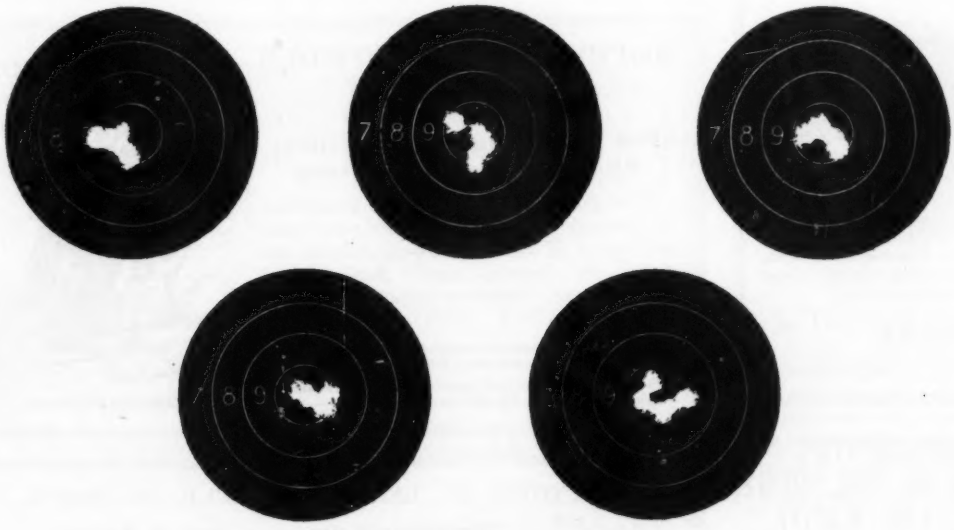

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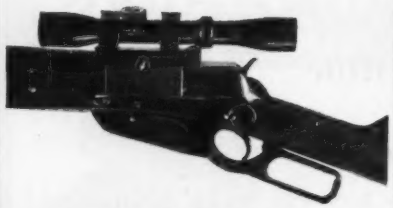

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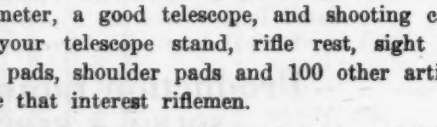

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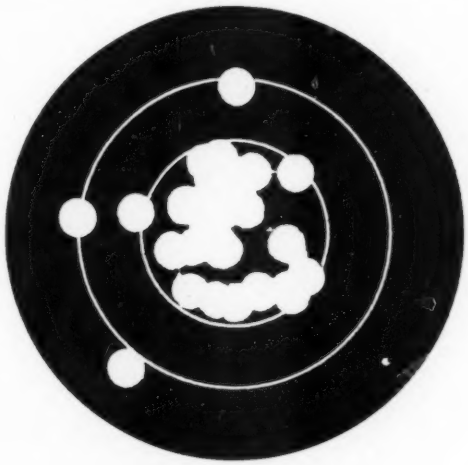

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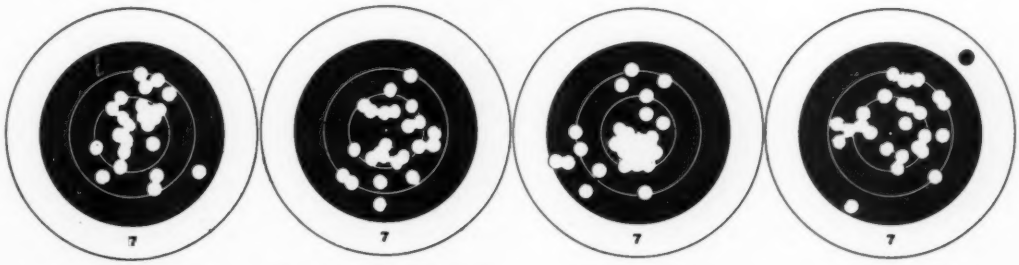

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